

**STORMWATER
POLLUTION
PREVENTION PLAN**

**REQUIREMENTS FOR
CITY PROJECTS**



CITY OF BEL AIRE
DEPARTMENT OF PUBLIC WORKS
STORM WATER MANAGEMENT DIVISION

**EROSION CONTROL INSTRUCTIONS
FOR
CITY STREET CONSTRUCTION**

1. These instructions are intended to cover construction work on city streets including widening, installation of drainage systems, major resurfacing, intersection reconstruction, and contract maintenance to assure compliance with City code.
2. Should the project disturb 5-acres of ground or more, the City **must** apply for a federal/state NPDES Storm Water Discharge Permit by sending a Notice of Intent (NOI) to KDHE in Topeka. As a part of that process, **the street contractor will be required to prepare a Storm Water Pollution Prevention Plan (SWP3) for the project prior to construction.** This plan **must** be submitted to the City for review and approved before construction begins.
3. For projects disturbing less than 5-acres, the filing of a NOI with KDHE is not required, but the use of adequate erosion control devices **is required** on all construction sites. Contractors are **strongly urged** to prepare a pollution prevention plan for each project and have it reviewed by the City prior to construction.
4. **Erosion control devices must be installed on site before construction begins.**
5. To determine where erosion control devices will be required, project site conditions must be assessed. Examine the right-of-way boundaries within the project limits to find locations where water from disturbed areas can flow from the project site onto other adjacent properties, ditches, lakes, or storm drains. These are all locations at which the contractor **will be required** to install erosion control devices unless a minimum 20-foot grass buffer strip is maintained (undisturbed). These locations will generally require haybale or silt fence barriers.
6. The contractor **is required** to use stabilized construction entrances at all locations where construction vehicles or equipment will access the project site from streets outside of the project limits.
7. If storm sewer work is included as part of the project, the contractor **will be required** to install inlet protection on all area and curb opening inlets on the project site **as soon as** the surrounding grades are such that storm water can drain into them. For drains located in sags or **sumps**, inlet protection is required **at all times** regardless of the surrounding grade conditions.

8. Protecting Existing Inlets – Existing inlets, both on and off the construction site may also require protection. Protection **will be required** whenever sediment-laden water from the construction can reach an inlet.
9. Curb opening inlet protection will consist of gravel filters or acceptable tubing devices offset from the face of the inlet so as to not totally obstruct flow. Haybales and sandbags are not allowed. Area inlet protection will be silt fence, haybales, or gravel filters.
10. The contractor **must** provide a washout pit for concrete trucks, as needed. Said pit shall be signed or its location revealed to each driver. These pits will be cleaned up and backfilled at the end of construction.
11. Curb and Gutter Construction – Once curbs are backfilled to within 3-inches or less from top of curb, the contractor is **required** to install back of curb protection at all locations on the project where runoff will drain over the curb. As a short term alternative, if additional work is yet to be done back of curb that would result in damage to the back of curb protection devices, the contractor may opt to not backfill the curb completely (leaving it 3-inches or lower from top of curb) as an interim device. If this method is chosen, the contractor **must** inspect the back of curbs at least once each week and after every rain of ½-inch or more and clean out any areas that have silted in. See City Standard Detail Sheets. Once the final back of curb work is completed (sidewalks, landscaping, etc.), the remainder of the curb shall be backfilled.
12. The final back of curb protection shall be installed **within 48-hours** of final curb backfill and will generally consist of sod or seed and fertilizer under an 8-foot wide erosion control mat.
13. Erosion mats must be pinned down per manufacturers recommendations except that, on north and south edges, double the recommended number of pins (½ normal spacing) will be used.
14. The contractor **will be required** to inspect all erosion control devices at least once each week and after every rainfall event of ½-inch or more to ensure that they are working properly. A written report of each inspection must be maintained on the project site. Properly installed devices will trap sediment and **must be cleaned out** before 60% of their capacity is used.
15. The contractor must install erosion control devices per City standard specifications. For these devices to be effective, **they must be dug into the ground.**
16. If a drainage feature such as a stream or pond runs through the project site, the contractor **will be required** to install erosion control devices along these features within the project limits, if necessary, to prevent sediment from entering the water feature.

17. Failure to comply with these instructions will subject the contractor to the various enforcement actions and/or penalties available to the City under the provisions of the contract, as well as the Criminal and/or Administrative penalties prescribed in the Stormwater Ordinance adopted by the City in addition to contractual penalties.

**STORMWATER
POLLUTION
PREVENTION PLAN**

**REQUIREMENTS FOR
SUB-DIVISIONS**



CITY OF BEL AIRE
DEPARTMENT OF PUBLIC WORKS
STORM WATER MANAGEMENT DIVISION

**EROSION CONTROL POLICY
FOR
SUBDIVISION DEVELOPMENT**

I. Developer Requirements:

1. If the development of the subdivision, in its entirety, will disturb 5-acres of ground or more, the developer **must** apply for a federal/state NPDES storm water discharge permit by sending a Notice of Intent (NOI) to KDHE in Topeka. The development of a Storm Water Pollution Prevention Plan is **required**. **This must be done before construction begins.**
2. The developer **must** furnish the City Of Bel Aire a copy of the NOI and Pollution Prevention Plan **before construction begins.**
3. Assess site conditions. Examine perimeter of subdivision to find locations where water can flow from the project site onto other adjacent properties, public rights-of-way, or ditches. Determine if there are creeks, ditches, or ponds located on the site. These are all locations at which the **developer** will be required to install erosion control devices unless a minimum 20-foot grass buffer strip is maintained (undisturbed) between disturbed earth and the property line or drainage feature. These locations will generally require haybale or silt fence barriers.
4. The developer **must** install stabilized construction entrances/exits wherever construction traffic leaves or enters existing streets.
5. The **developer** is required to inspect these erosion control devices at least once each week **and** after every rain of ½-inch or more to determine the condition of the devices. Written documentation of inspections must be maintained. Maintain devices to keep in good condition. Clear silt and sediment out from behind them before 60% of capacity is utilized.
6. Erosion control devices **must** be buried in the ground to be effective.
7. The **developer** must review the erosion control requirements with each purchaser of property and/or builder working in the subdivision. Each should be required to sign an acknowledgement statement verifying that they are aware of these requirements.
8. As the development of the subdivision progresses, various contractors, such as those installing streets and storm sewers, will be required to install additional

erosion control devices. Once these devices are installed, the **developer** will be responsible for inspecting and maintaining them.

9. As construction work in all or major portions of a subdivision is completed, and disturbed areas are at least 80% stabilized, the **developer** will be required to remove and dispose of any remaining erosion control devices.
10. Failure to comply with these instructions will subject the developer to the Administrative Penalties prescribed in Article X of the Stormwater Ordinance.

II. Utility Company Requirements: (Water, Sanitary Sewer, Gas, Electric, Cable)

1. Before utility installation begins, each utility company should review the developers Pollution Prevention Plan (for projects disturbing 5-acres or more) or at least discuss the erosion control plans with the developer.
2. If the utility work is performed **before** streets are installed, and providing that the developer has installed the erosion control practices outline in Section I. above, utility companies will not be required to install additional devices while working **on this site**.
3. If the utility work is performed **after** streets are installed, and provided that the developer, street, and storm sewer contractors have installed their required devices, utility companies will not be required to install additional devices **providing that** they protect the devices installed by others.
4. Utility companies will be required to protect all erosion control devices present while installing their facilities. Any devices damaged must be repaired before the end of each workday. Devices can be temporarily removed to facilitate utility construction, but **must** be **properly replaced** at the end of each workday.
5. Utility companies must access the site from existing streets via a stabilized construction entrance. If one is not available at the desired location, the utility company **shall** provide one. Any mud in advertently tracked onto any street shall be removed at the close of work each day.
6. Often, in subdivision work, utilities must make tie-ins at locations **off the actual subdivision site**. At those locations, the utility company may be required to install erosion control devices – see “Erosion Control Installations for Utilities”.
7. In newer subdivisions, utility companies will find that the city street contractors have installed an erosion control mat over seed and fertilizer back of curb. **This is an erosion control device that must be protected at all times**. If damaged or removed, it must be repaired by smoothing the ground, reseeding, refertilizing, reinstalling the mat, pinned down per manufacturers recommendations.

8. Failure to comply with those instructions will subject the utility company to the Criminal and/or Administrative penalties prescribed in Article X of the Stormwater Ordinance.

III. Storm Sewer Contractor:

1. All of the conditions contained in Section II. above shall apply except as indicated in this section below.
2. Area Drains: As soon as these structures are backfilled to the point that they can receive sediment-bearing runoff, inlet protection **must** be installed. This will be either a haybale or silt fence device, or gravel filter.
3. Street Drains: If located in a low point sag, inlet protection **must** be installed by the storm sewer contractor as soon as the structure is backfilled. This protection will consist of gravel filter or acceptable tubing offset from the face of the inlet so as to not totally obstruct flow. Haybales and sandbags are **not** allowed.

For street drains on grade (i.e. – not in a sag), inlet protection will not normally be needed until such time as the street paving is complete. In isolated instances where eroded soil does find its way into these inlets, inlet protection will be installed by the storm sewer contractor.

4. Outlet Protection: At the outlet of new storm sewer systems into a lake or ditch, normally the construction plans will specify some type of permanent control device such as a headwall, slope paving, or rip-rap. If erosion is anticipated outside of the permanent device, the storm sewer contractor will install erosion control matting to protect the area.
5. Failure to comply with these instructions will subject the contractor to the Administrative Penalties or Criminal Penalties outlined in Article X of the Stormwater Ordinance.

IV Street Construction Contractor:

1. Before beginning construction, the contractor **shall** familiarize himself with the developer's erosion protection plan **as well as** the requirements contained in the City's Standard Erosion Control Plan Policy.
2. The contractor **shall**, at all times, protect the erosion control devices installed by the developer and those installed by utility contractors. Devices that are, for whatever reason, removed and damaged must be adequately replaced at the end of each workday.

3. Construction traffic can access existing streets **only** at stabilized construction entrances. Any mud inadvertently tracked onto existing streets must be removed at the end of each workday.
4. The street contractor **shall** provide a washout pit for concrete trucks, as needed. Said pit will be signed or its location revealed to each driver. These pits will be cleaned up and backfilled at the end of construction.
5. Curb and Gutter Construction – once curbs are backfilled to within 3-inches or less from top of curb, the contractor is **required** to install back of curb protection at all locations where runoff water will drain over the curb. As a short term alternative, if additional work is yet to be done back of curb that would result in damage to back of curb protective devices, the contractor may opt to not backfill the curb completely (leaving it 3-inches or lower from top of curb) as an interim device. If this method is chosen, the contractor **must** inspect the back of curbs at least once each week and after every rain of ½-inch or more and clean out any areas that have silted in. See City Standard Detail sheets. Once the back of curb work is complete (sidewalks, landscaping, etc.), the remainder of the curb shall be backfilled.
6. The final back of curb protection shall be installed within 48 hours of final curb backfill and will normally consist of seed and fertilizer with an 8-foot wide erosion control mat on the surface or sod. All erosion control mats will be pinned down per manufacturers recommendations except that on exposed north and south edges, double the recommended number of pins (½ the spacing) will be used.
7. Curb Inlets Not in Sags – Inlet protection will be installed by the street contractor on these inlets as soon as water can flow into them. The protection will consist of gravel filters or acceptable tubing offset from the face of the inlet so as to not totally obstruct flow. Haybales or sandbags are **not** allowed.
8. Failure to comply with these instructions will subject the contractor to the Administrative and/or Criminal penalties as outlined in Article X of the Stormwater Ordinance adopted by the City.

V. Single Parcel Requirements:

See “Erosion Control for "Sub-division"”.

VI. Homeowner Requirements:

See “Erosion Control for "New Homes"”.

**STORMWATER
POLLUTION
PREVENTION PLAN**

**REQUIREMENTS FOR
SINGLE PARCEL**



CITY OF BEL AIRE
DEPARTMENT OF PUBLIC WORKS
STORM WATER MANAGEMENT DIVISION

**EROSION CONTROL POLICY FOR
SINGLE PARCEL DEVELOPMENT**

I. Contractor Requirements:

1. If the parcel or lot, in its entirety, will disturb 5-acres of ground or more, the Contractor **must** apply for a federal/state NPDES storm water discharge permit by sending a Notice of Intent (NOI) to KDHE in Topeka if it is not covered under the developer's permit. (See Sub-Division Development)The development of a Storm Water Pollution Prevention Plan is **required. This must be done before construction begins.**
2. The Contractor **must** furnish the City of Bel Aire a copy of the NOI and Pollution Prevention Plan or sign an agreement to comply with the Developer's plan **before construction begins. (See Agreement form)**
3. Assess site conditions. Examine perimeter of subdivision to find locations where water can flow from the project site onto other adjacent properties, public rights-of-way, or ditches. Determine if there are creeks, ditches, or ponds located on the site. These are all locations at which the **developer** will require BMPs to be installed as affective erosion control devices unless a minimum 20-foot grass buffer strip is maintained (undisturbed) between disturbed earth and the property line or drainage feature. These locations will generally require haybale or silt fence barriers.
4. The Contractor **must** install stabilized construction entrances/exits wherever construction traffic leaves or enters existing streets as approved by the Developer.
5. The **Contractor** is required to inspect these erosion control devices at least once each week **and** after every rain of ½-inch or more to determine the condition of the devices. Written documentation of inspections must be maintained. Maintain devices to keep in good condition. Clear silt and sediment out from behind them before 60% of capacity is utilized.
6. Erosion control devices **must** be buried in the ground to be effective.
7. The **Contractor** must review the erosion control requirements with each purchase of property and/or builder working in the subdivision. Each should be required to sign an acknowledgement statement verifying that they are aware of these requirements. (See Agreement form)
8. Failure to comply with these instructions will subject the developer to the Administrative Penalties prescribed in Article X of the Stormwater Ordinance.

12/18/08

II. Sub-Contractor Requirements: (Delivery trucks, trades, excavation, etc.)

1. Before entering in the job site, each sub-contractor company should review the contractor's Pollution Prevention Plan (for projects disturbing 5-acres or more) or at least discuss the erosion control plans with the developer and contractor.
2. If the work or activity is performed **before** streets are installed, and providing that the developer has installed the erosion control practices outline in Section I. above, sub-contractors will not be required to install additional devices while working **on this site**.
3. If the work or activity is performed **after** streets are installed, and provided that the developer, street, and storm sewer contractors have installed their required devices, sub-contractors will not be required to install additional devices **providing that** they protect the devices installed by others.
4. Sub-contractors will be required to protect all erosion control devices present while installing their facilities. Any devices damaged must be repaired before the end of each workday. Devices can be temporarily removed to facilitate construction, but **must be properly replaced** at the end of each workday.
5. Sub-contractors must access the site from existing streets via a stabilized construction entrance. If one is not available at the desired location, the sub-contractor or Contractor **shall** provide one. Any mud in advertently tracked onto any street shall be removed at the close of work each day or the project will be shut down until and action will be taken as city code allows.
6. Often, in building in a subdivision, access to the site is made **off the actual building site**. At those locations, the sub-contractors may be required to install erosion control devices – see “Erosion Control sub-division”.
7. In newer subdivisions, sub-contractors will find that the city street contractors have installed an erosion control mat over seed and fertilizer back of curb. **This is an erosion control device that must be protected at all times**. If damaged or removed, it must be repaired by smoothing the ground, reseeding, refertilizing, reinstalling the mat, pinned down per manufacturers recommendations.
8. Construction traffic can access existing streets **only** at stabilized construction entrances. Any mud inadvertently tracked onto existing streets must be removed at the end of each workday.
9. The contractor **shall** provide a washout pit for concrete trucks, as needed. Said pit will be signed or its location revealed to each driver. These pits will be cleaned up and backfilled at the end of construction.
10. Once curbs are backfilled to within 3-inches or less from top of curb, the contractor is **required** to install back of curb protection at all locations where runoff water will drain over the curb. As a short term alternative, if additional work is yet to be done back of curb that would result in damage to back of curb protective devices, the contractor may opt to not backfill the curb completely (leaving it 3-inches or lower from top of curb) as an interim device. If this method is chosen, the contractor **must** inspect the back of curbs at least once each week and after every rain of ½-inch or more and clean out any areas that have silted in. See City Standard Detail sheets.

12/18/08

Once the back of curb work is complete (sidewalks, landscaping, etc.), the remainder of the curb shall be backfilled. Siding and HDPE pipe are not acceptable back of curb BMP.

11. The Contractor is to provide sufficient trash disposal facilities that are covered to avoid blowing trash; sub-contractors can be held responsible for littering in addition to the contractor.

12. Failure to comply with those instructions will subject the utility company to the Criminal and/or Administrative penalties prescribed in Article X of the Stormwater Ordinance and other City codes.

8. Construction traffic can access existing streets **only** at stabilized construction entrances. Any mud inadvertently tracked onto existing streets must be removed at the end of each workday.

9. The contractor **shall** provide a washout pit for concrete trucks, as needed. Said pit will be signed or its location revealed to each driver. These pits will be cleaned up and backfilled at the end of construction.

10. Once curbs are backfilled to within 3-inches or less from top of curb, the contractor is **required** to install back of curb protection at all locations where runoff water will drain over the curb. As a short term alternative, if additional work is yet to be done back of curb that would result in damage to back of curb protective devices, the contractor may opt to not backfill the curb completely (leaving it 3-inches or lower from top of curb) as an interim device. If this method is chosen, the contractor **must** inspect the back of curbs at least once each week and after every rain of ½-inch or more and clean out any areas that have silted in. See City Standard Detail sheets. Once the back of curb work is complete (sidewalks, landscaping, etc.), the remainder of the curb shall be backfilled.

11. Failure to comply with those instructions will subject the utility company to the Criminal and/or Administrative penalties prescribed in Article X of the Stormwater Ordinance and other City codes.



Stormwater Pollution Prevention Agreement

Project Location: _____
(address or legal description)

I certify under penalty of law that I understand the terms and conditions of the National Pollution Discharge Elimination System (NPDES) permit that authorizes the stormwater discharges associated with construction activity from the construction site identified as part of this certification and with the stormwater pollution prevention ordinance of the city, and I agree to implement and follow the provisions of the Stormwater Pollution Prevention Plan (SWP3) for the construction site.

Builder: _____

Company: _____
(contractor, subcontractor, or material supplier)

Company Address: _____

Telephone Number: _____

Signature: _____

Title: _____

Date: _____

This completed form to be retained by Builder for each company entering job site.



EROSION CONTROL INSTRUCTION FOR BUILDING SITES

1. For the purpose of these instructions, the builder is defined as the individual or company that holds the building permit for the structure being built.
2. Prior to the beginning of construction, the builder must determine the erosion control requirements for the site and submit a Stormwater Pollution Prevention Plan (SWP3) to the City. If the site is located in a new subdivision for which the developer has prepared a Stormwater Pollution Prevention Plan, the builder **must comply** with the developers SWP3 as well as these instructions.
3. The builder is responsible to ensure that all contractors, sub-contractors, and material suppliers comply with all erosion control requirements at the site. The builder is required to have all contractors, sub-contractors, and material suppliers sign a certification statement that they understand and agree to abide by the SWP3 for the site. A copy of the certification is provided with this form.
4. If the building site is located in a new subdivision, the city street contractor may have installed a back of curb erosion control device (i.e. sod or erosion control mat) at the completion of his work. **This is an acceptable back of curb device and no other device may be required at this location so long as the device is protected and properly maintained.** At locations where concentrated flow results in sediments overtopping the mat or sod and getting in to the street, **a supplemental erosion control device must be installed behind the sod or mat.** The supplemental devices most commonly consist of silt fence or hay bale barriers.
5. In older subdivisions, the building site may have no back of curb erosion control device in place prior to construction, or a device that was in place may have been destroyed. **In these cases, the builder will be required to install a back of curb protective device.** This device may be hay bales, silt fences, or another suitable barrier that will keep sediment out of the street. **The excavation of a trench is not an acceptable device.**
6. Black tubing (HDPE), plywood, or siding will not be allowed as a back of curb BMP.

7. If the builder, their sub-contractors, or suppliers pull onto a building site during wet conditions, the builder must provide a stabilized construction entrance to access the site.
8. If the back lot drainage is to be by a rear yard swale, the builder shall install a ditch check erosion control device at the downstream property line. These ditch checks will normally be hay bales or silt fence.
9. If the construction site is immediately adjacent to a stream, lake, or pond, the builder will be required to install a silt fence or hay bale barrier between the site and the drainage feature, unless the developer has already installed such devices.
10. The builder shall inform all those working on the site that it is unlawful to remove or destroy an erosion control device. Should it be absolutely necessary to remove a device for access purposes, the device will be properly replaced before the end of each workday.
11. The builder will inspect all erosion control devices at least once each week and after each rainfall of ½-inches or more as recorded at Jabara Airport during that time period of construction and will repair any damaged devices. Any sediment collection behind the device will be cleaned out before 60% of its capacity is used.
12. To be effective, erosion control devices must be properly installed. These devices need to be dug into the ground and properly staked into position.
13. Any mud that may inadvertently be tracked from the building site onto an adjacent street must be cleaned up at the end of each day's work.
14. Concrete trucks are to wash out only in designated areas, such as pits provided by the developer. If the developer has not provided such facilities, the builder should provide a washout pit close to the building site. Concrete trucks will not be permitted to wash out on public common property. (i.e. City right-of-way or platted reserves)
15. The builder will provide sufficient trash disposal facilities for the work being done. Dumpster lids shall be kept closed to minimize blowing trash in the areas.
16. Failure to comply with these instructions will subject the builder to the Criminal and Administrative penalties prescribed in Article X of the City Stormwater Ordinance.

**STORMWATER
POLLUTION
PREVENTION PLAN**

**REQUIREMENTS FOR
NEW HOMES**





Welcome to your new home...

As a new owner in the area, there is some information we wanted you to be aware of regarding steps that you are required to take to prevent erosion on your site and runoff from the site to the extent that stormwater pollution can occur.

A Stormwater Pollution Prevention Ordinance has been adopted by the City of Bel Aire. Provisions of the ordinance apply to all property owners and certain steps must be taken to assure soil from the site does not get washed into the streets, drainage ditches or ponds when storms occur. This is because soil is considered a pollutant and when it is washed in storm sewers or other storm drainage systems is ultimately gets in streams and rivers and pollutes them.

As a homeowner in the area you must take certain steps to assure you are doing your part to prevent pollution of this type from occurring. If your yard is not yet in and established you can utilize silt fencing, sand bags, or straw bales around the parameter of your property to prevent soil from being washed into the streets. In addition, if you back up to a pond, lake, creek or other type of drainage system you should take steps to assure sediment is not washed into these areas. Care should also be taken when landscaping the property to assure that soil on the site or any additional soil that might be delivered to the site is contained. Such measures will be highly effective in preventing storm water pollution and will assure that city inspectors and other enforcement personnel who are frequently in the area will not have cause to issue a Notice of Violation, a citation, or take other enforcement action against you. Your neighbors will also appreciate your efforts in this regard and this will help assure your neighborhood looks presentable and attractive at all times.

Developers and builders are required to take similar steps during construction of homes and other improvements in the area and we all must do our part to comply with provisions of the city's ordinance.

Specific information regarding provisions of the ordinance and how they apply to you can be obtained from the Department of Community Development

Thank you for your consideration.

CITY OF BEL AIRE
DEPARTMENT OF PUBLIC WORKS
STORM WATER MANAGEMENT DIVISION

**EROSION CONTROL INSTRUCTIONS
FOR
OWNERS OF NEW HOMES**

As the owner of a new home, you are required to take steps to prevent soil erosion from your lot resulting in storm water pollution. On December 18, 2008, a Storm Water Pollution Prevention Ordinance went into effect in the City of Bel Aire. The ordinance is the result of Federal pollution laws mandated by Congress. Provisions of the ordinance apply to all property owners and certain steps must be taken to assure soil from the site does not get washed into the streets, drainage ditches, backyard drainage swales, or ponds when storms occur.

If your yard is not yet in (having at least 75% of your grass established) you are required to use erosion control devices to ensure that soil does not erode from your property during storms. You can utilize devices such as silt fencing, sand bags, straw bales, or erosion control mats. If your yard is adjacent to a pond, creek, or other type of drainage feature you must take steps to assure sediment is not washed into these areas. If you have a walkout or viewout basement, a drainage easement will usually exist at the rear lot line. Sediment cannot be allowed in this area also. Care should be taken when landscaping the property to assure that soil on the site or additional soil that might be delivered to the site is contained.

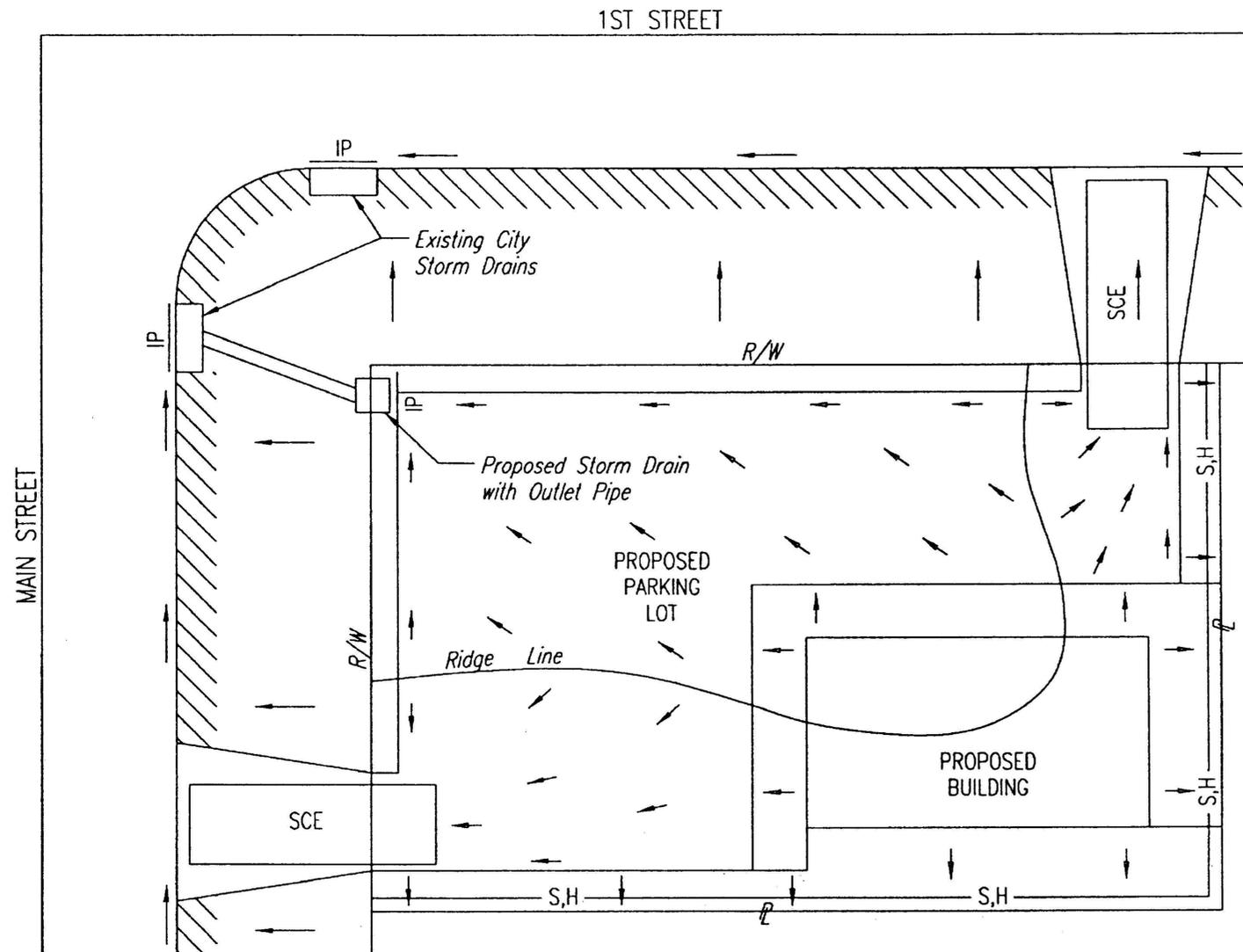
To be effective, all erosion control devices must be dug into the ground and must be maintained on a regular basis. You should inspect the devices you install at least once each week and after every storm of ½-inch of rain or more. Maintenance includes repairing damaged devices and removing trapped sediment before 60% of the capacity of the device is used.

Failure to use effective erosion control devices will subject the property owner to the criminal penalties as prescribed in Article X of the City Stormwater Ordinance.

STORMWATER POLLUTION PREVENTION PLAN

MAPS





LEGEND

- Flow Direction
- IP Inlet Protection - to be provided at all inlets subject to silt laden runoff.
- S,H - Silt Fence or Hay Bale Barrier - to be installed along property lines where runoff from construction site can run onto other properties.
- SCE Stabilized Construction Entrance - to be used at all locations where vehicles or equipment enter or exit property.
- Back of Curb Protection - to be installed whenever curb is backfilled to less than 3 inches from top and disturbed earth exists adjacent thereto. (See City Standard Details.)

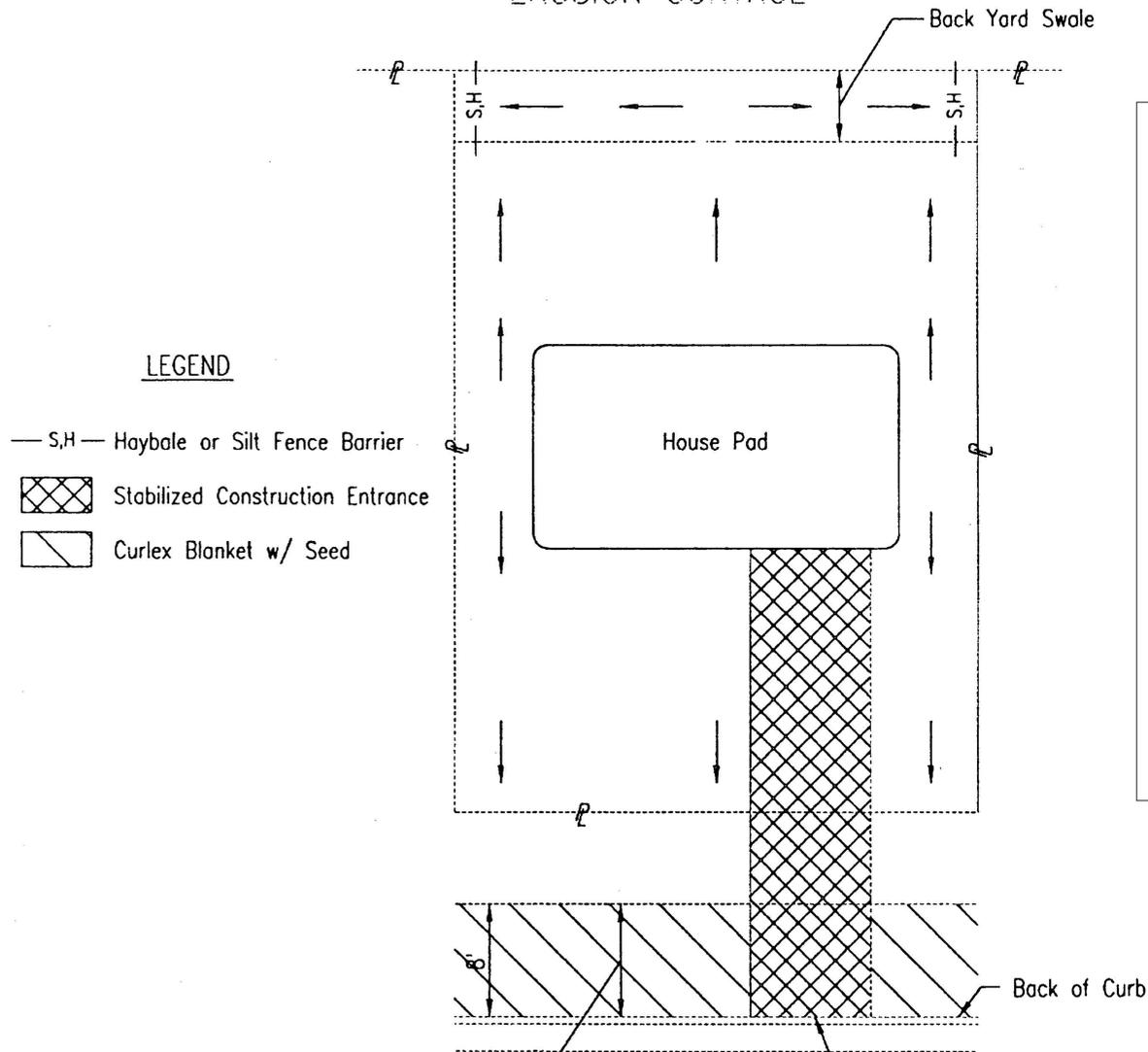
GENERAL REQUIREMENTS

1. **THIS STANDARD DETAIL IS APART OF YOUR BUILDING PERMIT.** THE BMP'S SHOWN ON THIS SHEET ARE **CONSIDERED MINIMUM STANDARDS.** WHENEVER SEDIMENT ENTERS THE STREETS, STORM SEWERS, DITCHES, PONDS, THE CONTRACTOR WILL INSTALL ADDITIONAL BMP'S, AS NEEDED, TO CORRECT THE PROBLEM.
2. FOLLOW THESE GENERAL PRINCIPLES ON ALL BUILDING SITES ON THE ENTIRE PERIMETER OF THE CONTAINMENT AREA.
3. THE SOIL EROSION BMP'S SHOWN HEREON MUST BE IN PLACE AT ALL TIMES AS THE SITE IS RE-ESTABLISHED WITH CONSTRUCTED FINAL IMPROVEMENTS AND POTENTIAL EROSION SOURCES ARE ELIMINATED.
4. FAILURE TO INSTALL, PROTECT, AND MAINTAIN BMP'S ARE VIOLATIONS OF THE STORMWATER ORDINANCE AND CITY CODE THAT WILL SUBJECT THE CONTRACTOR TO THE PENALTIES PROVIDED THEREIN. INCLUDED WITH EACH BUILDING PERMIT IS AN AGREEMENT TO SIGN FOR EACH COMPANY ENTERING THE JOB SITE TO DO THEIR PART IN MAINTAINING THE BMP'S DURING CONSTRUCTION. THIS INFORMATION SHOULD BE KEPT READILY AVAILABLE BY THE CONTRACTOR.
5. BACK OF CURB PROTECTION: CAN INCLUDE HAY BALES, SILT FENCE, OR CURLEX, AS SHOWN. HDPE PIPE AND SIDING ARE NOT ACCEPTABLE MATERIALS FOR PERIMETER BMP USE. THESE BMP'S MUST REMAIN IN PLACE UNTIL A PERMANENTE EROSION BARRIER IS IN PLACE; IE LANDSCAPING, PAVEMENT, AND TURF.
6. **THE GENERAL CONTRACTOR** IS RESPONSIBLE FOR INSTALLATION AND MAINTENANCE OF ALL BMP'S. DISREGARD FOR CITY CODES CAN HAVE IMMEDIATE CONSEQUENCE OF A STOP WORK ORDER PLACED ON THE PROJECT, A TICKET ISSUED TO DRIVERS OF VEHICLES TRACKING MUD INTO THE STREET.
7. BMP'S MUST BE INSTALLED TO PROTECT LAKES, PONDS, NEIGHBORING PROPERTY IN ADDITION TO THE CITY ROW.
8. MUD INADVERTENTLY TRACKED ONTO ANY STREET OR SIDEWALK WILL BE CLEANED UP BY THE GENERAL CONTRACTOR AS SOON AS POSSIBLE WITH A GRACE PERIOD OF 4 HOURS.



**SOIL EROSION BMP'S
COMMERCIAL
DEVELOPMENT SITES**

INDIVIDUAL RESIDENTIAL LOT
EROSION CONTROL



LEGEND

- S,H — Haybale or Silt Fence Barrier
-  Stabilized Construction Entrance
-  Curlex Blanket w/ Seed

GENERAL REQUIREMENTS

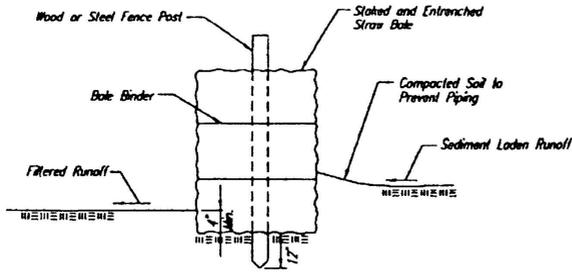
1. THIS STANDARD DETAIL IS APART OF YOUR BUILDING PERMIT. THE BMP'S SHOWN ON THIS SHEET ARE CONSIDERED MINIMUM STANDARDS. WHENEVER SEDIMENT ENTERS THE STREETS, STORM SEWERS, DITCHES, PONDS, THE CONTRACTOR WILL INSTALL ADDITIONAL BMP'S, AS NEEDED, TO CORRECT THE PROBLEM.
2. FOLLOW THESE GENERAL PRINCIPLES ON ALL BUILDING SITES ON THE ENTIRE PERIMETER OF THE CONTAINMENT AREA.
3. THE SOIL EROSION BMP'S SHOWN HEREON MUST BE IN PLACE AT ALL TIMES AS THE SITE IS RE-ESTABLISHED WITH CONSTRUCTED FINAL IMPROVEMENTS AND POTENTIAL EROSION SOURCES ARE ELIMINATED.
4. FAILURE TO INSTALL, PROTECT, AND MAINTAIN BMP'S ARE VIOLATIONS OF THE STORMWATER ORDINANCE AND CITY CODE THAT WILL SUBJECT THE CONTRACTOR TO THE PENALTIES PROVIDED THEREIN. INCLUDED WITH EACH BUILDING PERMIT IS AN AGREEMENT TO SIGN FOR EACH COMPANY ENTERING THE JOB SITE TO DO THEIR PART IN MAINTAINING THE BMP'S DURING CONSTRUCTION. THIS INFORMATION SHOULD BE KEPT READILY AVAILABLE BY THE CONTRACTOR.
5. BACK OF CURB PROTECTION: CAN INCLUDE HAY BALES, SILT FENCE, OR CURLEX, AS SHOWN. HDPE PIPE AND SIDING ARE NOT ACCEPTABLE MATERIALS FOR PERIMETER BMP USE. THESE BMP'S MUST REMAIN IN PLACE UNTIL A PERMANENTE EROSION BARRIER IS IN PLACE: IE LANDSCAPING, PAVEMENT, AND TURF.
6. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR INSTALLATION AND MAINTENANCE OF ALL BMP'S. DISREGARD FOR CITY CODES CAN HAVE IMMEDIATE CONSEQUENCE OF A STOP WORK ORDER PLACED ON THE PROJECT. A TICKET ISSUED TO DRIVERS OF VEHICLES TRACKING MUD INTO THE STREET.
7. BMP'S MUST BE INSTALLED TO PROTECT LAKES, PONDS, NEIGHBORING PROPERTY IN ADDITION TO THE CITY ROW.
8. MUD INADVERTENTLY TRACKED ONTO ANY STREET OR SIDEWALK WILL BE CLEANED UP BY THE GENERAL CONTRACTOR AS SOON AS POSSIBLE WITH A GRACE PERIOD OF 4 HOURS.

DO NOT DISTURB
If Curlex Excelsior Blanket with seed and fertilizer or equivalent BMP has been placed back of curb. If not present, or if builder destroys integrity of this area, builder will be required to replace back of curb sediment barrier. (See General Notes)

Install and maintain stabilized construction entrance, if concrete drive is not present.



SOIL EROSION BMP'S
RESIDENTIAL BUILDING
LOTS



STRAW BALE BARRIERS

Material Specification:

Bale slope barriers may be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture. The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.

Placement:

A slope barrier should be used at the toe of a slope when a ditch does not exist. The slope barrier should be placed on nearly level ground 5' to 10' away from the toe of a slope. The barrier is placed away from the toe of the slope to provide adequate storage for settling out sediment. When practicable, bale slope barriers should be placed along contours to avoid a concentration of flow. Bale slope barriers can also be placed along right-of-way fence lines to keep sediment from crossing onto adjacent property. When placed in this manner, the slope barrier will not likely follow contours.

Proper installation method:

Excavate a trench the length of the planned slope barrier that is 4" deep and a bale's width wide. Make sure that the trench is excavated along a single contour. When practicable, slope barriers should be placed along contours to avoid a concentration of flow. Place the soil on the upslope side of the trench for later use. Place the bales in the trench, making sure that they are butted tightly. Two stakes should be driven through each bale along the centerline of the ditch check, approximately 6" to 8" from the bale ends. Stakes should be driven at least 12" into the ground. Once all the bales have been installed and anchored, place the excavated soil against the upslope side of the check and compact it. The compacted soil should be no more than 3" to 4" deep.

List of common placement/installation mistakes to avoid:

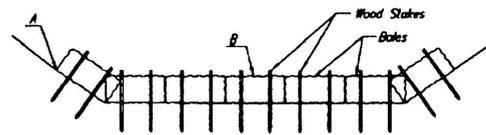
When practicable, do not place bale slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. Concentrated flow over a slope barrier creates a scour hole on the downslope side of the barrier. The scour hole eventually undermines the bales and the barrier fails. Do not place bale slope barriers in areas with shallow soils underlain by rock. If the barrier is not anchored sufficiently, it will wash out. Bale slope barriers must be dug into the ground. Bales at ground level do not work because they allow water to flow under the barrier.

Inspection and Maintenance:

Bale slope barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Are there any points along the slope barrier where water is concentrating?
- Does water flow under the slope barrier?
- Does water flow through spaces between abutting bales?
- Are any bales dislodged?
- Are bales decomposing due to age and/or water damage?
- Does sediment need to be removed from behind the slope barrier?

NOTE: Point A must be higher than Point B so that water flows over the bales and not around them.



STRAW BALE DITCH CHECKS

Material Specification:

Bale ditch checks may be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture. The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. Optional: The downstream scour apron should be constructed of a double-netted straw erosion-control blanket at least 6' wide. Optional: The metal landscape staples used to anchor the erosion-control blanket should be at least 8" long.

Placement:

Bale ditch checks should be placed perpendicular to the flowline of the ditch. The ditch check should extend far enough so that the ground level at the ends of the check is higher than the top of the lowest center bale. This prevents water from flowing around the check. Checks should not be placed in ditches where high flows are expected. Rock checks should be used instead. Bales should be placed in ditches with slopes of 6% or less. For slopes steeper than 6%, rock checks should be used. The following table provides check spacing for a given ditch grade:

Ditch grade (%)	Check Spacing (feet)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

Proper installation method:

Excavate a trench perpendicular to the ditch flowline that is 4" deep and a bale's width wide. Extend the trench in a straight line along the entire length of the proposed ditch check. Place the soil on the upstream side of the trench—it will be used later. Optional: On the downstream side of the trench, roll out a length of erosion-control blanket (scour apron) equal to the length of the trench. Place the upstream edge of the erosion-control blanket along the bottom upstream edge of the trench. The erosion control blanket should be anchored in the trench with one row of 8" landscape staples placed on 18" centers. The remainder of the erosion-control blanket (the portion that is not lying in the trench) will serve as the downstream scour apron. This section of the blanket should be anchored to the ground with 8" landscape staples placed around the perimeter of the blanket on 18" centers. The remainder of the blanket should be anchored using two evenly spaced rows of 8" landscape staples on 18" centers placed perpendicular to the flowline of the ditch. Place the bales in the trench, making sure that they are butted tightly. Two stakes should be driven through each bale along the centerline of the ditch check, approximately 6" to 8" from the bale ends. Stakes should be driven at least 12" into the ground. Once all the bales have been installed and anchored, place the excavated soil against the upstream side of the check and compact it. The compacted soil should be no more than 3" to 4" deep and extend upstream no more than 24".

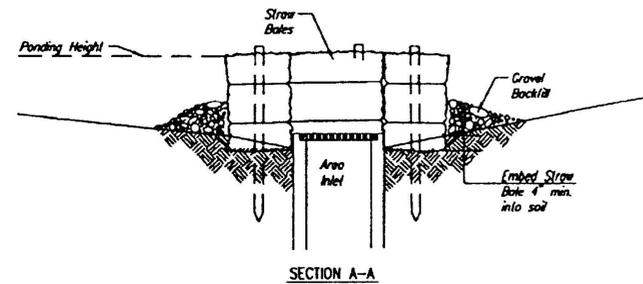
List of common placement/installation mistakes to avoid:

Do not place a bale ditch check directly in front of a culvert outlet. It will not stand up to the concentrated flow. Do not place bale ditch checks in ditches that will likely experience high flows. They will not stand up to concentrated flow. Follow prescribed ditch-check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks. Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the check is higher than the top of the lowest center bale. Do not place bale ditch checks in channels with shallow soils underlain by rock. If the check is not anchored sufficiently, it will wash out. Bale ditch checks must be dug into the ground. Bales at ground level do not work because they allow water to flow under the check.

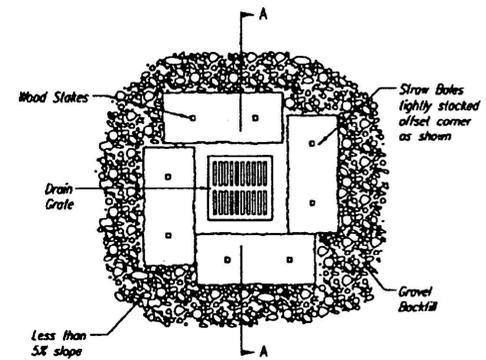
Inspection and Maintenance:

Bale ditch checks should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow around the ditch check?
- Does water flow under the ditch check?
- Does water flow through spaces between abutting bales?
- Are any bales and/or scour aprons (optional) dislodged?
- Are bales decomposing due to age and/or water damage?
- Does sediment need to be removed from behind the ditch check?



SECTION A-A



STRAW BALE BARRIERS FOR AREA INLETS (INLET PROTECTION)

Material Specification:

Bale area inlet barriers should be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture. The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.

Placement:

Bale area inlet barriers should be placed directly around the perimeter of a drop inlet. When a bale area inlet barrier is located near an inlet that has steep approach slopes, the storage capacity behind the barrier is drastically reduced. Timely removal of sediment must occur for a barrier to operate properly in this location.

Proper installation method:

Excavate a trench around the perimeter of the area inlet that is at least 4" deep by a bale's width wide. Place the bales in the trench, making sure that they are butted tightly. Some bales may need to be shortened to fit into the trench around the area inlet. Two stakes should be driven through each bale, approximately 6" to 8" from the bale ends. Stakes should be driven at least 12" into the ground. Once all the bales have been installed and anchored, place the excavated soil against the receiving side of the barrier and compact it. The compacted soil should be no more than 3" to 4" deep.

Note: When a bale area inlet barrier is placed in a shallow median ditch, make sure that the top of the barrier is not higher than the paved road. In this configuration, water may spread onto the roadway causing a hazardous condition.

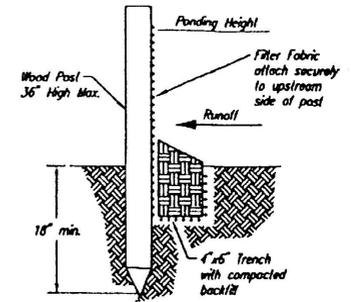
List of common placement/installation mistakes to avoid:

Bales should be placed directly against the perimeter of the area inlet. This allows overtopping water to flow directly into the inlet instead of onto nearby soil causing scour. Bale area inlet barriers must be dug into the ground. Bales at ground level do not work because they allow water to flow under the barrier.

Inspection and Maintenance:

Bale area inlet barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow under the area inlet barrier?
- Does water flow through spaces between abutting bales?
- Are any bales dislodged?
- Are bales decomposing due to age and/or water damage?
- Does sediment need to be removed from behind the area inlet barrier?



SILT FENCE BARRIERS

SILT FENCE BARRIERS

Material Specification:

Silt fence fabric should conform to the ASTM D2875 silt fence specification. The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. Silt fence fabric should be attached to the wooden posts with staples, wire, zip ties, or nails.

Placement:

A slope barrier should be used at the toe of a slope when a ditch does not exist. The slope barrier should be placed on nearly level ground 5' to 10' away from the toe of a slope. The barrier is placed away from the toe of the slope to provide adequate storage for settling out sediment. When practicable, silt fence barriers should be placed along contours to avoid a concentration of flow. Silt fence slope barriers can also be placed along right-of-way fence lines to keep sediment from crossing onto adjacent property. When placed in this manner, the slope barrier will not likely follow contours.

Proper installation method:

Excavate a trench the length of the planned slope barrier that is 6" deep by 4" wide. Make sure that the trench is excavated along a single contour. When practicable, slope barriers should be placed along contours to avoid a concentration of flow. Place the soil on the upslope side of the trench for later use. Roll out a continuous length of silt fence fabric on the downslope side of the trench. Place the edge of the fabric in the trench starting at the top upslope edge. Line all three sides of the trench with the fabric. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt fence fabric should remain exposed. Lay the exposed silt fence upslope of the trench to clear an area for driving in the posts. Just downslope of the trench, drive posts into the ground to a depth of at least 18". Place posts no more than 4' apart. Attach the silt fence to the anchored post with staples, wire, zip ties, or nails.

List of common placement/installation mistakes to avoid:

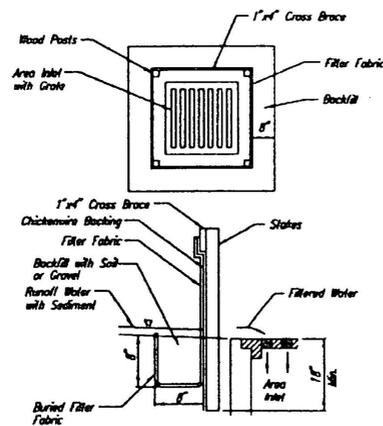
When practicable, do not place silt fence slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. When the flow concentrates, it overtops the barrier and the silt fence slope barrier quickly deteriorates. Do not place silt fence posts on the upslope side of the silt fence fabric. In this configuration, the force of the water is not restricted by the posts, but only by the staples (wire, zip ties, nails, etc.). The silt fence will rip and fail. Do not place silt fence slope barriers in areas with shallow soils underlain by rock. If the barrier is not sufficiently anchored, it will wash out. Silt fence slope barriers must be dug into the ground—silt fence at ground level does not work because water will flow underneath.

Inspection and Maintenance:

Silt fence slope barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Are there any points along the slope barrier where water is concentrating?
- Does water flow under the slope barrier?
- Do the silt fences sag excessively?
- Has the silt fence torn or become detached from the posts?
- Does sediment need to be removed from behind the slope barrier?





SILT FENCE BARRIERS FOR AREA INLETS
(INLET PROTECTION)

Material Specification:

Silt fence fabric should conform to the ASTM D 2875 96 silt fence specification. The wire or polymeric mesh backing used to help support the silt fence fabric should conform to the ASTM D 2875 96 silt fence specification. The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. The material used to frame the tops of the posts should be 1" by 4" boards. Silt fence fabric and support backing should be attached to the wooden posts and frame with staples, wire, zip ties, or nails.

Placement:

Place a silt fence drop inlet barrier in a location where it is unlikely to be overlapped. Water should flow through silt fence, not over it. Silt fence barriers for area inlets often fail when repeatedly overlapped. When used as a barrier for area inlets, silt fence fabric and posts must be supported at the top by a wooden frame. When a silt fence barrier for area inlets is located near an inlet that has steep approach slopes, the storage capacity behind the barrier is drastically reduced. Timely removal of sediment must occur for a barrier to operate properly in this location.

Proper installation method:

Excavate a trench around the perimeter of the area inlet that is at least 6" deep by 6" wide. Drive posts to a depth of at least 18" around the perimeter of the area inlet. The distance between posts should be 4' or less. If the distance between two adjacent corner posts is more than 4', add another post(s) between them. Connect the tops of all the posts with a wooden frame made of 1" by 4" boards. Use nails or screws for fastening. Attach the wire or polymeric-mesh backing to the outside of the post/frame structure with staples, wire, zip ties, or nails. Roll out a continuous length of silt fence fabric long enough to wrap around the perimeter of the area inlet. Add more length for overlapping the fabric joint. Place the edge of the fabric in the trench, starting at the outside edge of the trench. Line all three sides of the trench with the fabric. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt fence fabric should remain exposed. Attach the silt fence to the outside of the post/frame structure with staples, wire, zip ties, or nails. The joint should be overlapped to the next post.

Note: When a silt fence barrier for area inlet is placed in a shallow median ditch, make sure that the top of the barrier is not higher than the paved road. In this configuration, water may spread onto the roadway causing a hazardous condition.

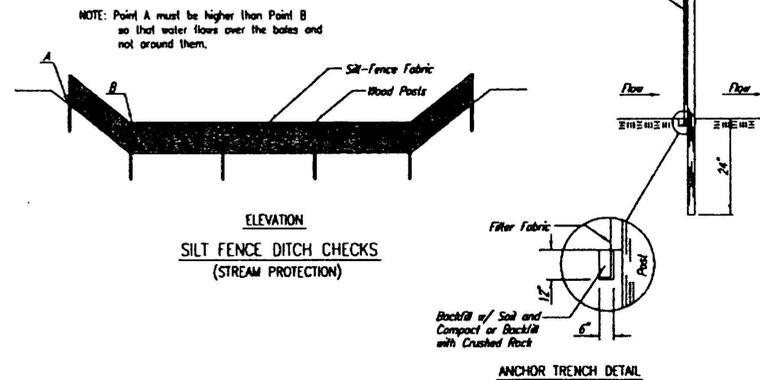
List of common placement/installation mistakes to avoid:

Water should flow through a silt fence barrier for area inlet—not over it. Place a silt fence barrier for area inlet in a location where it is unlikely to be overlapped. Silt fence barrier for area inlets often fail when repeatedly overlapped. Do not place posts on the outside of the silt fence barrier for area inlet. In this configuration, the force of the water is not resisted by the posts, but only by the staples (wire, zip-ties, nails, etc.). The silt fence will rip and fail. Do not install silt fence barrier for area inlets without framing the top of the posts. The corner posts around area inlets are stressed in two directions whereas a normal silt fence is only stressed in one direction. This added stress requires more support.

Inspection and Maintenance:

Silt fence barrier for area inlets should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow under the silt fence?
- Does the silt fence sag excessively?
- Has the silt fence torn or become detached from the posts?
- Does sediment need to be removed from behind the area inlet barrier?



ELEVATION
SILT FENCE DITCH CHECKS
(STREAM PROTECTION)

Material Specification:

Silt fence fabric should conform to the ASTM D 2875 96 silt fence specification. The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. Silt fence fabric should be attached to the wooden posts with staples, wire, zip ties, or nails.

Placement:

Place silt fence in ditches where it is unlikely that it will be overlapped. Water should flow through a silt fence ditch check, not over it. Silt fence ditch checks often fail when overlapped. Silt fence ditch checks should be placed perpendicular to the flowline of the ditch. The silt fence should extend far enough so that the ground level at the ends of the fence is higher than the top of the low point of the ditch. This prevents water from flowing around the check. Checks should not be placed in ditches where high flows are expected. Rock checks should be used instead. Silt fence should be placed in ditches with slopes of 6% or less. For slopes steeper than 6%, rock checks should be used.

The following table provides check spacing for a given ditch grade:

Ditch Check Ditch grade (%)	Spacing Check (feet)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

Proper installation method:

Excavate a trench perpendicular to the ditch flowline that is at least 12" deep by 6" wide. Extend the trench in a straight line along the entire length of the proposed ditch check. Place the soil on a straight line along the entire length of the trench for later use. Roll out a continuous length of silt fence fabric on the downstream side of the trench. Place the edge of the fabric in the trench starting at the top upstream edge of the trench. Line two sides of the trench with the fabric as shown on detail. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt fence fabric should remain exposed. Lay the exposed silt fence on the upstream side of the trench to clear an area for driving in the posts. Just downstream of the trench, drive posts into the ground to a depth of at least 24". Place posts no more than 4' apart. Attach the silt fence to the anchored post with staples, wire, zip ties, or nails.

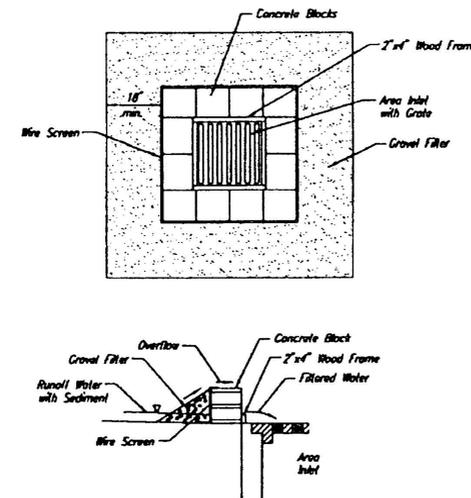
List of common placement/installation mistakes to avoid:

Water should flow through a silt fence ditch check—not over it. Place silt fence in ditches where it is unlikely that it will be overlapped. Silt fence installations quickly deteriorate when water overlaps them. Do not place silt fence posts on the upstream side of the silt fence fabric. In this configuration, the force of the water is not resisted by the posts, but only by the staples (wire, zip ties, nails, etc.). The silt fence will rip and fail. Do not place a silt fence ditch check directly in front of a culvert outlet. It will not stand up to the concentrated flow. Do not place silt fence ditch checks in ditches that will likely experience high flows. They will not stand up to concentrated flow. Follow prescribed ditch check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks. Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the fence is higher than the low point on the top of the fence. Do not place silt fence ditch checks in channels with shallow soils underlain by rock. If the check is not anchored sufficiently, it will wash out.

Inspection and Maintenance:

Silt fence ditch checks should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow around the ditch check?
- Does water flow under the ditch check?
- Does the silt fence sag excessively?
- Has the silt fence torn or become detached from the posts?
- Does sediment need to be removed from behind the ditch check?



CONCRETE BLOCK FILTER FOR AREA DRAIN
(INLET PROTECTION)

Gravel barriers provide little filtering of large inflow waters. However, when installed correctly and maintained, they can effectively treat low runoff flows.

Placement of gravel filters around area drains must be completed in a manner that will not cause local flooding.

Gravel filters can be used if the immediate and adjacent area to the area drain consists of soil or pavement.

Only gravel filters are to be installed on top of the pavement.

Instructions for installing:

- STEP 1: Place concrete blocks around the grate. The blocks can be stacked one or two high and should be supported by a 2"x4" board.
- STEP 2: Wrap 1/2" mesh wire screen around the concrete blocks.
- STEP 3: Place 1" to 1-1/2" diameter rock around the blocks and wire screen. Be sure the rock extends down from the top of the concrete block.
- STEP 4: To prevent damage to vehicles, signs warning drivers about the structures may be necessary.

An alternative method is use of gravel bags that are supported to prevent collapsing.

Use of rock having diameters smaller than 1" may result in clogging of pores and reduce the amount of water flowing into an inlet.

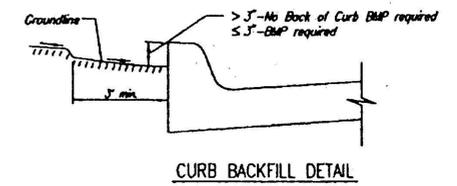
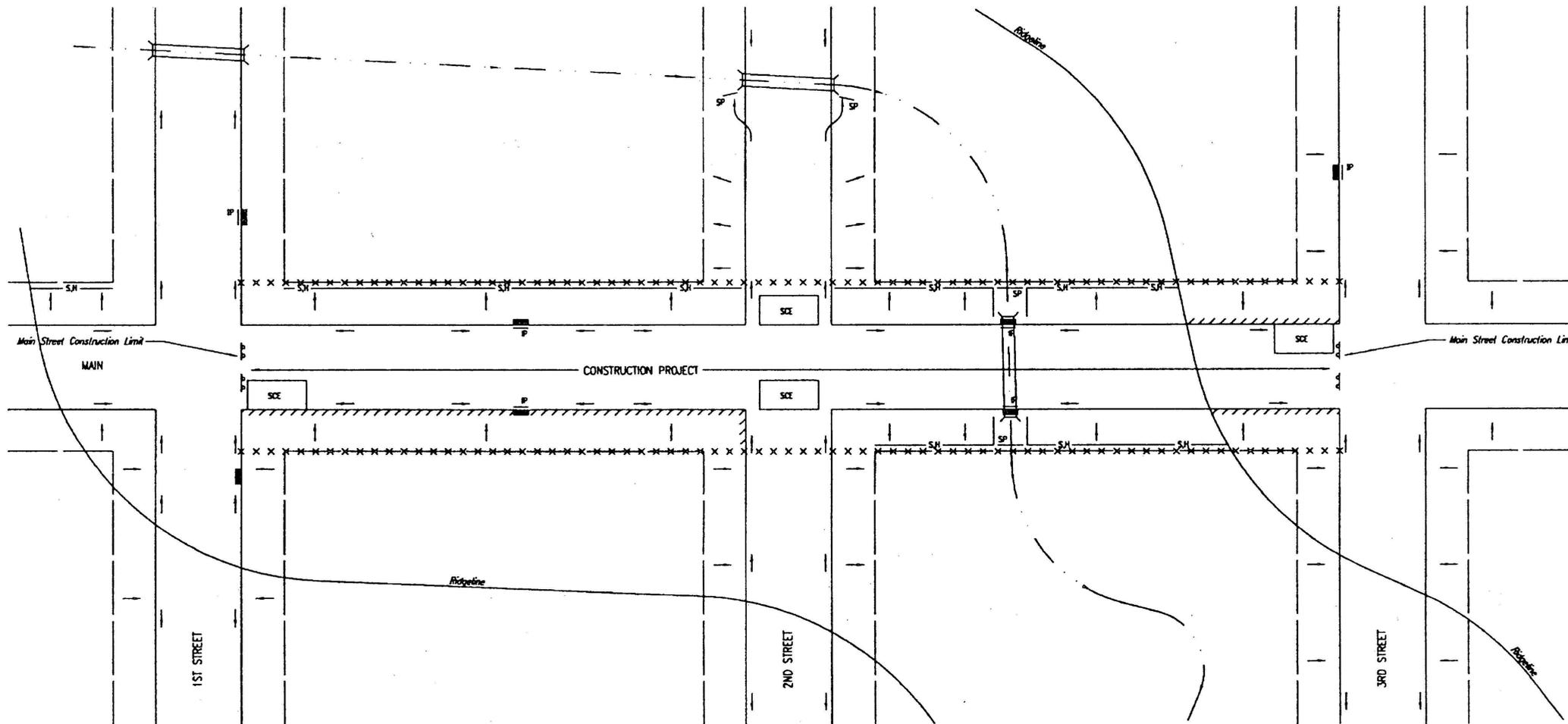
Maintenance:

All gravel filters installed around area drains should be inspected and repaired after each runoff event. Sediment should be removed when material is within 3" of the top of any block. Periodically, the gravel should be raked to increase infiltration and filtering of runoff waters. Accumulated sediment is to be removed immediately from roads and streets after every runoff event.

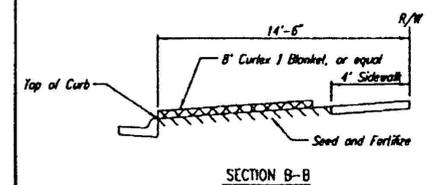


GENERAL NOTES:

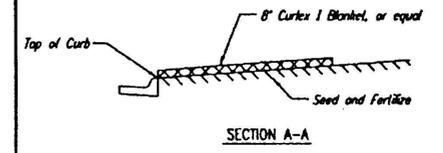
- THIS SHEET IS INTENDED TO PROVIDE GUIDELINES AS TO WHAT TYPES OF BMP'S WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS. CONTRACTORS ARE EXPECTED TO BID PROJECTS ACCORDINGLY.
- BMP'S MUST BE MAINTAINED BY THE CONTRACTOR THROUGHOUT THE CONSTRUCTION PROCESS.
- IF THE PROJECT WILL DISTURB 5 ACRES OR MORE, A FEDERAL/STATE NPDES STORMWATER PERMIT IS REQUIRED. A DETAILED STORMWATER POLLUTION PREVENTION PLAN, IS REQUIRED. THE BMP'S SHOWN ON THIS SHEET ARE CONSIDERED TO BE THE MINIMUM TO BE SHOWN IN THE POLLUTION PREVENTION PLAN.
- FOR PROJECTS DISTURBING LESS THAN 5 ACRES, CONTRACTORS ARE ENCOURAGED TO PREPARE STORMWATER POLLUTION PREVENTION PLANS PRIOR TO CONSTRUCTION.
- FAILURE TO USE AND MAINTAIN BMP'S IS A VIOLATION OF SECTION 16.32 OF THE CITY CODE AND WILL SUBJECT THE CONTRACTOR TO THE PENALTIES PROVIDED FOR THEREIN.
- THE APPLICATION OF BMP'S SHOWN ON THIS SHEET IS FOR SITUATIONS NORMALLY ENCOUNTERED. FROM TIME TO TIME, SITUATIONS WILL ARISE THAT MAY REQUIRE A DIFFERENT BMP OTHER THAN THOSE SHOWN. BMP'S, OTHER THAN THOSE SHOWN, MAY BE UTILIZED AS LONG AS THEY ARE EFFECTIVE AND MAINTAINED.



CURB BACKFILL DETAIL

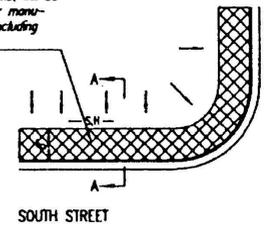


SECTION B-B



SECTION A-A

BMP-Install 8" wide Curlex I Excelsior Blanket, or equal, on prepared surface back of curb. Edge of blanket will be at back of curb. Install per manufacturer's recommendation, including staples.



SOUTH STREET

BMP-Install 8" wide Curlex I Excelsior Blanket, or equal, on prepared surface back of curb. Edge of blanket will be at back of curb. Install per manufacturer's recommendation, including staples.

BACK OF CURB PROTECTION DETAIL

NOTES:

- EXCELSIOR MAT TO BE INSTALLED WHEN SOD IS NOT SPECIFIED ON PROJECT.
- EXCELSIOR BLANKET TO BE INSTALLED OVER SEED AND FERTILIZER, AS SPECIFIED IN THE PROJECT SPECIFICATIONS.
- AFTER INSTALLATION OF EXCELSIOR BLANKET, AT LOCATIONS WHERE CONCENTRATED FLOW CARRIES SEDIMENT OVER THE CURB AND INTO THE GUTTER, SUPPLEMENTAL BMP'S WILL BE INSTALLED BY THE CONTRACTOR AS NEEDED, TO FIX THE PROBLEM.

NOTES:

- GENERAL BMP GOAL IS TO KEEP ALL SEDIMENT CONFINED TO THE CONSTRUCTION SITE, AND OUT OF ALL UNDERGROUND PIPES, DITCHES, AND OTHER DRAINAGE FACILITIES.
- THE POINT OF COMPLIANCE IS GENERALLY THE RIGHT-OF-WAY LINES WITHIN THE LIMITS OF CONSTRUCTION.
- BMP'S WILL BE REQUIRED AT ALL POINTS ALONG THE PROJECT WHERE DISTURBED EARTH CAN DRAIN ONTO PRIVATE PROPERTY.
- INLET PROTECTION DEVICES WILL BE REQUIRED WHEREVER WATER CAN DRAIN OFF THE PROJECT SITE INTO AN INLET, INCLUDING ANY SIDE STREET INLETS.
- BMP'S SHALL BE INSTALLED AT CREEK CROSSINGS SO AS TO PREVENT SEDIMENT FROM ENTERING THEREIN.
- STABILIZED CONSTRUCTION ENTRANCES SHALL BE PROVIDED, AS NEEDED, TO PREVENT MUD FROM TRACKING ONTO STREETS NOT UNDER CONSTRUCTION AND ON STREETS WITHIN THE PROJECT LIMITS IF TRAFFIC IS BEING MAINTAINED THROUGH THE PROJECT.
- ANY MUD TRACKED ONTO STREETS MUST BE REMOVED AT THE END OF EACH WORK DAY.
- THE CONTRACTOR WILL BE REQUIRED TO PLACE BMP'S BACK OF CURB, WHENEVER WATER CAN DRAIN OVER CURB, TO KEEP ERODED SOIL OUT OF THE CUTTERLINES, IN ACCORDANCE WITH THE FOLLOWING:
 - THE BMP REQUIRED WILL BE CURLEX I EXCELSIOR BLANKET, OR EQUAL. SAID BLANKET SHALL BE PLACED OVER THE APPROPRIATE SEED AND FERTILIZER, AS SPECIFIED IN THE PROJECT SPECIFICATIONS. (SEE BACK OF CURB PROTECTION DETAIL.)
 - THIS BMP SHALL BE INSTALLED IMMEDIATELY WHENEVER THE CURB IS BACKFILLED TO WITHIN 3" OF THE TOP OF CURB. (SEE CURB BACKFILL DETAIL.) OTHER BMP'S MAY BE REQUIRED AT LOCATIONS WHERE CONCENTRATED FLOW CARRIES SEDIMENT OVER THE CURB.
 - ADDITIONALLY, OTHER BMP'S (MAYBALES, SILT FENCE, ETC.) WILL BE INSTALLED AT LOCATIONS OF CONCENTRATED FLOW RESULTING IN SEDIMENT OVERRUNNING THE MAT.
 - SHOULD THE PROJECT PLANS SPECIFY THAT THE RIGHT-OF-WAY IS TO BE SODDED, THE EXCELSIOR MAT WILL NOT BE REQUIRED SO LONG AS THE SOD IS PLACED WITHIN 48 HOURS AFTER CURB BACKFILL REACHES A HEIGHT OF 3" OR LESS FROM TOP OF CURB. (SEE DETAIL.)

LEGEND

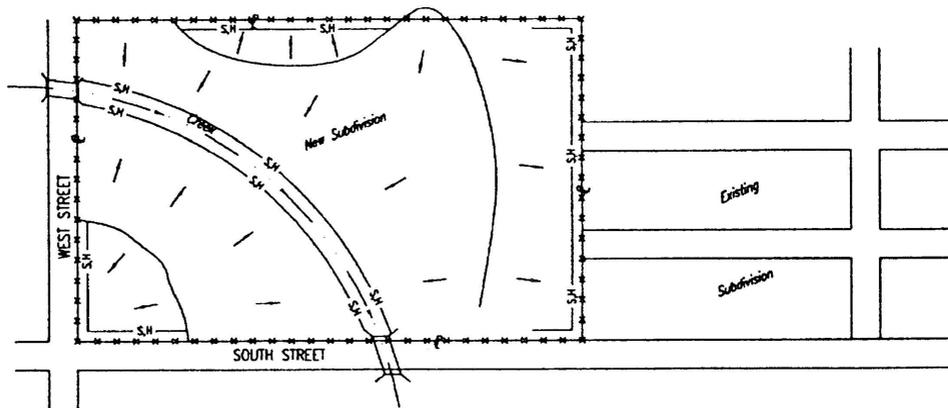
- R-O-W LIMITS
- DRAINAGE FLOW PATH
- x x x x x R/W LIMIT WITHIN CONSTRUCTION LIMIT
- STORM WATER INLETS
- P INLET PROTECTION
- S.H- SILT FENCE OR HAYBALE BMP
- SP STREAM PROTECTION
- SCE STABILIZED CONSTRUCTION ENTRANCE
- /// BACK OF CURB PROTECTION



CITY OF BEL AIRE
GENERAL DETAIL
OF STORMWATER
INLET PROTECTION
BMP DESIGN
PAGE 1 OF 3
2009

PHASE 1 - INITIAL EARTHWORK AND UTILITIES (EXCEPT STORM SEWER)

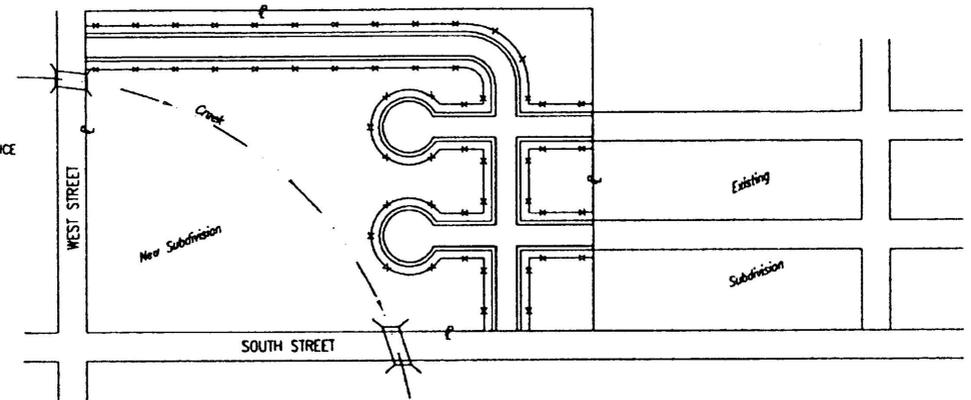
- LEGEND**
- - - DRAINAGE FLOW PATH
 - RIDGE LINES
 - x POINT OF COMPLIANCE
 - S.H. SILT FENCE OR HAY BALE BMP
 - DRAINAGEWAY FLOWLINE



1. DURING THIS PHASE OF SUBDIVISION CONSTRUCTION, THE POINTS OF COMPLIANCE ARE THE PERIMETER BOUNDARIES AND ANY DRAINAGE WAYS OR STORM SEWERS DRAINING THROUGH OR FROM THE SITE. SHOULD LAKES BE CONSTRUCTED WITHIN THE SUBDIVISION THAT WILL DISCHARGE DURING STORMS, THEY ARE ALSO A POINT OF COMPLIANCE.
2. HAYBALES OR SILT FENCE MUST BE CONSTRUCTED ALONG THE PROPERTY LINE WHERE ON SITE WATER CAN DRAIN OFF THE PROPERTY. THESE BMP'S WILL ALSO BE INSTALLED ALONG ANY DRAINAGE DITCH OR LAKE THAT CAN DISCHARGE.
3. SHOULD SILT OR SEDIMENT ENTER THE DITCHES OR GUTTERLINES ON THE ADJACENT BOUNDARY STREETS, APPROPRIATE BMP'S WILL BE PLACED WITHIN THE SUBDIVISION TO PREVENT THIS.
4. ANY MUD TRACKED ONTO ADJACENT STREETS WILL BE REMOVED AT THE END OF EACH WORK DAY.
5. CONTRACTORS WORKING WITHIN THE SITE WILL NOT BE REQUIRED TO USE INDIVIDUAL BMP'S AS LONG AS THOSE SPECIFIED ABOVE ARE IN PLACE AND EFFECTIVE. CONTRACTORS WORKING ON THE BOUNDARY LINE STREETS OR ON ADJACENT PROPERTIES TO EXTEND UTILITIES ARE EXPECTED TO USE BMP'S AT THEIR WORK LOCATIONS, AS NEEDED.
6. UTILIZE STABILIZED CONSTRUCTION ENTRANCE AT ENTRANCE AND EXIT ONTO ANY EXISTING PUBLIC STREETS.
7. THE SUBDIVISION DEVELOPER (OWNER) SHALL INSTALL AND MAINTAIN THE ON-SITE BMP'S.

PHASE 3 - STREET CONSTRUCTION

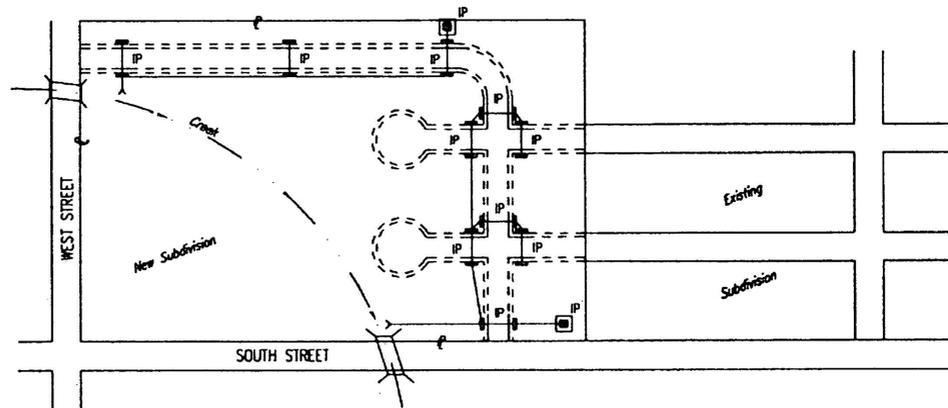
- LEGEND**
- == NEW STREETS
 - x- ADDITIONAL POINTS OF COMPLIANCE



1. DURING THIS PHASE OF SUBDIVISION CONSTRUCTION, NEW STREETS ARE INSTALLED. ALL BMP'S INSTALLED DURING PHASE 1 AND 2 MUST STILL BE MAINTAINED. THE POINT OF COMPLIANCE NOW SHIFTS TO THE BACK OF CURB ALONG EACH STREET.
2. CURB OPENING INLET PROTECTION:
 - A. SUMP AREAS - INLET PROTECTION SHALL BE PROVIDED WHEN STREET SUBGRADE WORK IS COMPLETED.
 - B. NON-SUMP LOCATIONS - PROVIDE INLET PROTECTION AS SOON AS BASE COURSE ASPHALT IS INSTALLED, BEFORE THE SURFACE COURSE LIFT.
3. BMP'S WILL BE REQUIRED BACK OF CURB WHEREVER WATER CAN FLOW OVER THE CURB AND THE CURB HAS BEEN BACKFILLED TO WITHIN 3" OR LESS OF THE TOP OF CURB (SEE CURB BACKFILL DETAIL). FOR CURBS NOT YET ENTIRELY BACKFILLED (3" OR MORE BELOW TOP OF CURB), BMP'S WILL BE REQUIRED AT POINTS WHERE WATER BREAKS OVER CURB WHICH COULD RESULT IN THE PLACEMENT OF SEDIMENT IN THE GUTTER.
4. SEE DETAIL THIS SHEET ON BACK OF CURB PROTECTION.
5. THE BACK OF CURB PROTECTION SPECIFIED ON THIS PLAN MAY HAVE TO BE SUPPLEMENTED WITH HAYBALE OR SILT FENCE BMP'S AT LOCATIONS WHERE CONCENTRATED FLOW RESULTS IN SEDIMENT BEING CARRIED OVER THE EXCELSIOR MATS.
6. THE STREET CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING BACK OF CURB BMP'S.
7. THE INDIVIDUAL LOT OWNERS WILL BE RESPONSIBLE FOR MAINTAINING THE BACK OF CURB BMP'S IN FRONT OF THEIR LOTS UNTIL SUCH TIME AS ADJACENT DISTURBED EARTH IS STABILIZED WITH GRASS OR SOO.

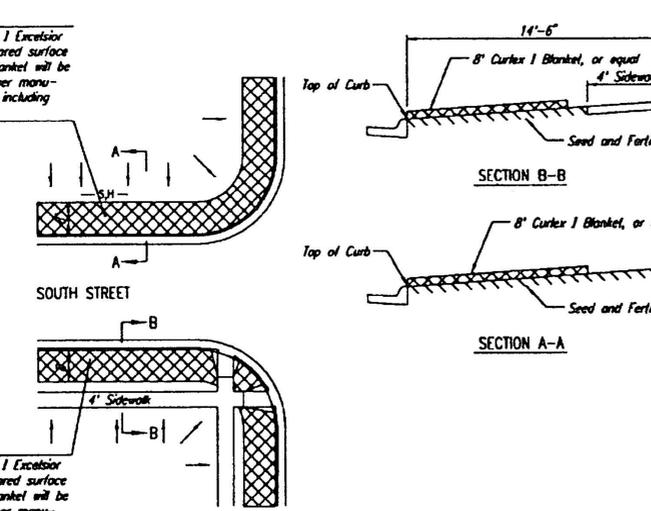
PHASE 2 - INSTALLATION OF STORM SEWER

- LEGEND**
- - - - PROPOSED NEW STREETS
 - CURB INLETS
 - AREA DRAINS
 - P- INLET PROTECTION



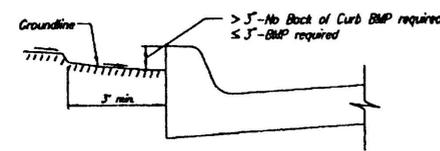
1. DURING THIS PHASE OF SUBDIVISION DEVELOPMENT, ALL BMP'S REQUIRED IN PHASE 1 SHALL REMAIN IN PLACE AND BE MAINTAINED.
2. AS NEW STORM SEWERS, WITH INLETS, ARE INSTALLED, THE STORM SEWERS MUST NOW BE PROTECTED SO ALL NEW INLETS BECOME POINTS OF COMPLIANCE.
3. AREA DRAINS - AS SOON AS WATER CAN FLOW INTO THESE DRAINS, HAYBALE OR SILT FENCE PROTECTION WILL BE INSTALLED AROUND THEM.
4. CURB OPENING INLETS - AS SOON AS WATER CAN FLOW INTO THESE DRAINS, INLET PROTECTION BMP'S MUST BE INSTALLED. SEE PHASE 3 - STREET CONSTRUCTION.
5. THE STORM SEWER CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING THESE BMP'S. IF WATER CANNOT FLOW INTO CURB INLETS UNTIL STREET CONSTRUCTION IS COMPLETE, THEN STREET CONTRACTOR WILL INSTALL INLET PROTECTION.
6. THE SUBDIVISION DEVELOPER WILL MAINTAIN THESE BMP'S ONCE INSTALLED.
7. ONCE ALL DISTURBED GROUND DRAINING TO AN INLET HAS BEEN RESTABILIZED WITH GRASS OR SOO, THE SUBDIVISION DEVELOPER WILL BE RESPONSIBLE FOR PERMANENTLY REMOVING THE INLET PROTECTION.

BMP-Install 8" wide Curlex I Excelsior Blanket, or equal, on prepared surface back of curb. Edge of blanket will be at back of curb. Install per manufacturer's recommendation, including staples.



BMP-Install 8" wide Curlex I Excelsior Blanket, or equal, on prepared surface back of curb. Edge of blanket will be at back of curb. Install per manufacturer's recommendation, including staples.

BACK OF CURB PROTECTION DETAIL

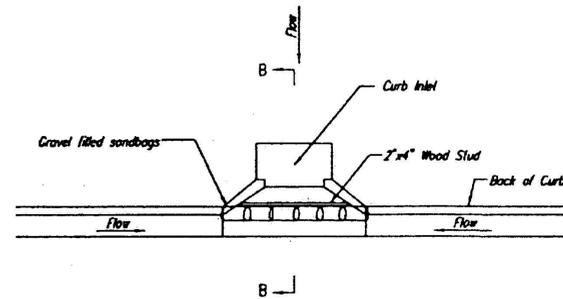
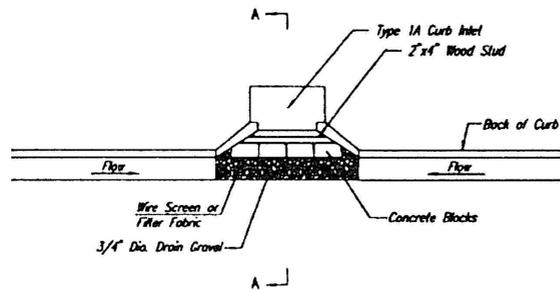
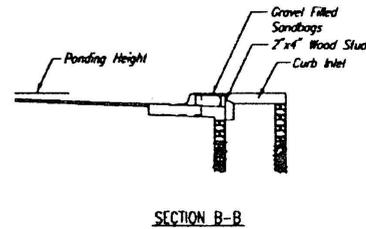
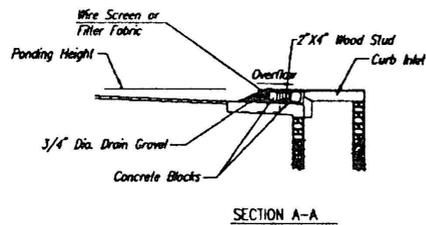


CURB BACKFILL DETAIL

GENERAL NOTES:

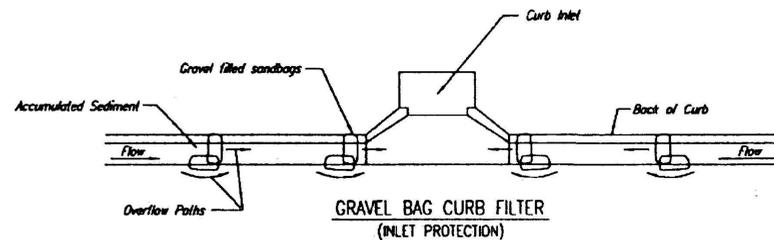
1. THE INTENT OF ALL BEST MANAGEMENT PRACTICES (B.M.P.'S) IS TO PREVENT ERODED SOIL FROM ENTERING DITCHES, STORM SEWERS, OR ANY OTHER DRAINAGE FEATURE.
2. THIS SHEET IS INTENDED TO PROVIDE GUIDELINES AS TO WHAT TYPE OF BMP'S WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS. CONTRACTORS ARE EXPECTED TO BID PROJECTS ACCORDINGLY.
3. BMP'S SHALL BE MAINTAINED DURING THE CONSTRUCTION PROCESS TO REMAIN EFFECTIVE. MAINTENANCE SHALL BE AS INDICATED ON THE BMP DETAIL SHEETS.
4. PERSONS DESTROYING BMP'S SHALL BE RESPONSIBLE FOR IMMEDIATELY REPAIRING THEM OR INSTALLING SUITABLE REPLACEMENT BMP'S.
5. THE DEVELOPMENT OF ANY SUBDIVISION THAT DISTURBS 5 ACRES OR MORE WILL REQUIRE A FEDERAL/STATE NONDES STORMWATER PERMIT. THE PREPARATION OF A STORMWATER POLLUTION PREVENTION PLAN IS REQUIRED. EROSION CONTROL BMP'S ARE REQUIRED. THE DETAILS SHOWN ON THIS SHEET ARE THE MINIMUM STANDARDS TO BE SHOWN ON POLLUTION PREVENTION PLAN.
6. FOR SUBDIVISIONS SMALLER THAN 5 ACRES, SOIL EROSION BMP'S ARE REQUIRED. ALSO, DEVELOPERS AND CONTRACTORS ARE ENCOURAGED TO DEVELOP POLLUTION PREVENTION PLANS FOR EACH PROJECT PRIOR TO CONSTRUCTION.
7. FAILURE TO USE AND MAINTAIN BMP'S IS A VIOLATION OF SECTION 16.32 OF THE CITY CODE AND WILL SUBJECT THE SUBDIVISION DEVELOPER AND CONTRACTORS TO THE PENALTIES PROVIDED THEREIN.
8. THE APPLICATION OF BMP'S SHOWN ON THIS SHEET IS FOR SITUATIONS NORMALLY ENCOUNTERED. FROM TIME TO TIME, SITUATIONS WILL ARISE THAT MAY REQUIRE A DIFFERENT BMP OTHER THAN THAT SHOWN. BMP'S, OTHER THAN THOSE SHOWN, MAY BE UTILIZED SO LONG AS THEY ARE EFFECTIVE AND MAINTAINED.
9. A STABILIZED EARTH SURFACE IS DEFINED AS ONE THAT IS HARD SURFACED WITH CONCRETE, ASPHALT, OR THE LIKE, OR ONE ON WHICH 70% OF THE GRASS HAS GERMINATED ON THE ENTIRE SURFACE.





**CURB INLET SANDBAG FILTERS
(INLET PROTECTION)**

NOTE: Other types of curb inlet protection may be approved by the City so long as equal protection is provided.



**GRAVEL BAG CURB FILTER
(INLET PROTECTION)**

NOTE: Place two or more sets of bags in a manner that results in maximum support. The flow line bag must be lower than top of curb.

CURB SEDIMENT TRAPS

When inlets are located on streets having a grade (i.e., sump conditions do not exist), installing gravel (or sand) bags in the gutter flow line to create small sediment traps can be considered. Gravel bags are recommended over sand bags to allow for drainage.

If the spacing between bags becomes too large, little sediment may be trapped. Spacing of bags should be completed using the table or graph that illustrates placement distances based upon street slope. When installed in the gutter, bag tops must be lower than the sidewalk.

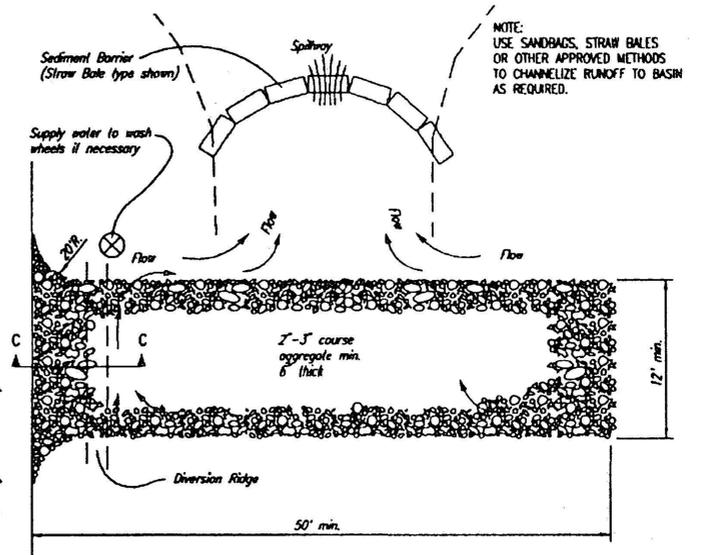
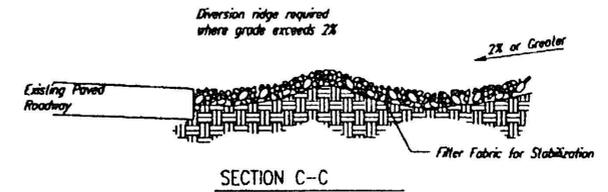
Spacing:

Gravel bags are to be placed according to street grades using the following table or graph that appears below.

GRADE (%)	SPACING (FEET)
0.5	75
1.0	45
2.0	18
3.0	12
4.0	9
5.0	6

Maintenance:

Collected sediment shall be removed after every runoff event. Bags that are destroyed by vehicular traffic or through natural deterioration are to be immediately replaced.



STABILIZED CONSTRUCTION ENTRANCE

NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN, AS SHOWN ABOVE.
4. DRIVE ENTRANCES ONTO RESIDENTIAL LOTS WILL NOT BE REQUIRED TO HAVE THE SEDIMENT BARRIER SHOWN, BUT WHEEL WASHING MAY BE REQUIRED IF STABILIZED ENTRANCE IS NOT SUFFICIENT TO KEEP MUD FROM BEING TRACKED ONTO ADJACENT STREET. ENTRANCE SHALL EXTEND FROM BACK OF CURB TO DWELLING.

**CURB INLET GRAVEL FILTERS
(INLET PROTECTION-RESIDENTIAL STREETS ONLY)**

NOTE: Other types of curb inlet protection may be approved by the City so long as equal protection is provided.

A gravel inlet filter shall be installed at sump locations on residential streets. This type of protection is not to be used on arterial or collector streets at any time that it would pose an undue traffic hazard.

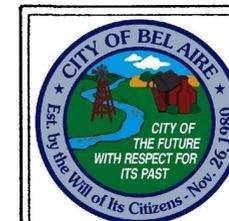
Instructions for Installing:

- STEP 1: Place concrete blocks around the inlet as shown on drawing. Insert 2x4 board as shown.
- STEP 2: Wrap 1/2" mesh wire screen around the concrete blocks.
- STEP 3: Place 1" to 1-1/2" diameter rock around the blocks and wire screen. Be sure the rock extends down from the top of the concrete block.
- STEP 4: To prevent damage to vehicles, signs warning drivers about the structures may be necessary. An alternative installation is the use of gravel bags supported by a 2x4" board to prevent clogging.

Use of rock with diameters smaller than 1" in the bag may result in clogging of pores and reduce the amount of water flowing into an inlet.

Maintenance:

All curb inlet gravel filters shall be inspected and repaired after each runoff event. Sediment deposits are to be removed once material is within 8 cm (3 inches) of the top of any block. Periodically, the gravel shall be raked to increase infiltration and filtering of runoff waters. Accumulated sediment is to be removed immediately from roads and streets.



STORMWATER POLLUTION PREVENTION PLAN

FORMS





SELF-INSPECTION CHECKLIST

Inspected By: _____

Project: _____

Contractor: _____

Date: _____

Check "Yes" or "No" or "N/A" if not applicable.

YES	NO	N/A	
_____	_____	_____	1. Has there been an absence of rain since the last inspection?
_____	_____	_____	2. Are all sediment barriers (e.g., sandbags, straw bales, and silt fences) in place in accordance with the WVECP and are they functioning properly?
_____	_____	_____	3. If present, are all exposed slopes protected from erosion through the implementation of acceptable soil stabilization practices?
_____	_____	_____	4. If present, are all sediment traps/basins installed and functioning properly (if applicable)?
_____	_____	_____	5. Are all material handling and storage areas reasonably clean and free of spills, leaks, or other deleterious materials?
_____	_____	_____	6. Are all equipment storage and maintenance areas reasonably clean and free of spills, leaks, or any other deleterious materials?
_____	_____	_____	7. Are all materials and equipment properly covered?

YES	NO	N/A	
_____	_____	_____	8. Are all external discharge points (i.e., outfalls) reasonably free of any noticeable pollutant discharges?
_____	_____	_____	9. Are all internal discharge points (i.e., storm drain inlets) provided with inlet protection?
_____	_____	_____	10. Are all external discharge points reasonably free of any significant erosion or sediment transport?
_____	_____	_____	11. Are all BMPs identified on the Plan installed in the proper location and according to the specifications for the plan?
_____	_____	_____	12. Are all structural control practices in good repair and maintained in functional order?
_____	_____	_____	13. Are all on-site traffic routes, parking, and storage of equipment and supplies restricted to areas designated in the Plan for those uses?
_____	_____	_____	14. Are all locations of temporary soil stockpiles or construction materials in approved areas?
_____	_____	_____	15. Are all seeded or landscaped areas properly maintained?
_____	_____	_____	16. Are sediment treatment controls in place at discharge points from the site?
_____	_____	_____	17. Are slopes free of significant erosion?
_____	_____	_____	18. Are all points of ingress and egress from the site provided with stabilized construction entrances?
_____	_____	_____	19. Is sediment, debris, or mud being cleaned from public roads at intersections with site access roads?

