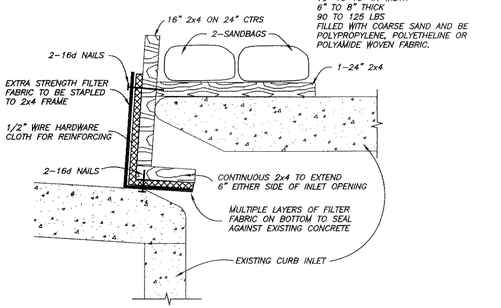
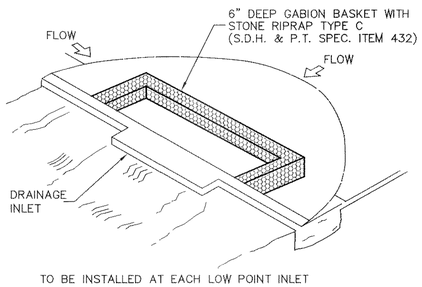
EROSION CONTROL PLAN



CURB INLET PROTECTION ON GRADE

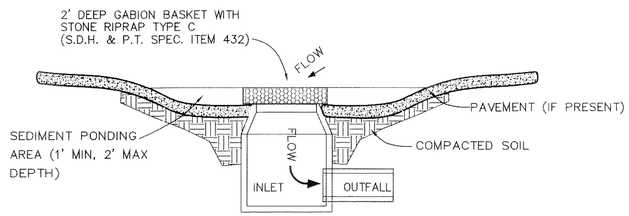
NOT TO SCALE



TO BE INSTALLED AT EACH LOW POINT INLET

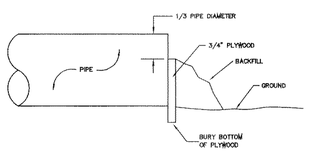
LOW POINT CURB INLET SEDIMENT FILTER

N.T.S.



SEDIMENT POND @ CURB INLETS & AREA DRAINS

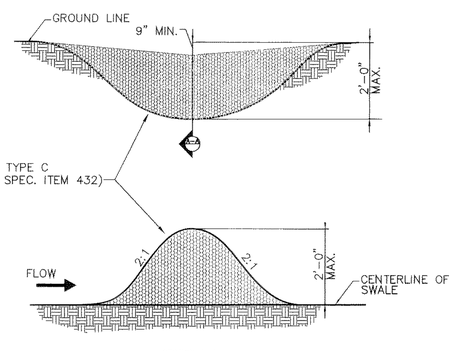
NOT TO SCALE



NOTE:
DUE TO ANY STOPPAGE IN CONSTRUCTION OR AT COMPLETION OF LINE, CONTRACTOR SHALL INSTALL 3/4" PLYWOOD OVER END OF PIPE AND BACKFILL TO SECURELY HOLD IN PLACE TO PREVENT SEDIMENT FROM ENTERING PIPE

PLYWOOD PROTECTION AT PIPE

N.T.S.



SECTION A-A

ROCK CHECK DAM DETAIL

N.T.S.

Solid Waste Management

DESCRIPTION
Large volumes of solid waste are often generated at construction sites including: packaging, pallets, wood waste, concrete waste, soil, electrical wiring, cuttings, and a variety of other materials. The solid waste management practice lists techniques to minimize the potential of storm water contamination from solid waste through appropriate storage and disposal practices.

PRIMARY USE
These practices should be a part of all construction practices. By limiting the trash and debris on site, storm water quality is improved along with reduced clean up requirements at the completion of the project.

APPLICATIONS
The solid waste management practice for construction sites is based on proper storage and disposal practices by construction workers and supervisors.. Key elements of the program are education and modification of improper disposal habits.. Cooperation and vigilance is required on the part of supervisors and workers to ensure that the recommendations and procedures are followed. Following are lists describing the targeted materials and recommended procedures:

- ☐ Targeted Solid Waste Materials
  - Paper and cardboard containers
  - Plastic packaging
  - Styrofoam packing and forms
  - Insulation materials (non-hazardous)
  - Wood pallets
  - Wood cuttings
  - Pipe and electrical cuttings
  - concrete, brick, and mortar waste
  - Shingle cuttings and waste
  - Roofing tar
  - Steel (cuttings, nails, rust residue)
  - Gypsum board cuttings and waste
  - Sheathing cuttings and waste
  - Miscellaneous cuttings and waste
  - Food waste
  - Demolition waste

Storage Procedures
- ☐ Wherever possible, minimize production of solid waste materials.
- ☐ Designate a foreman or supervisor to oversee and enforce proper solid waste procedures.
- ☐ Instruct construction workers in proper solid waste procedures.
- ☐ Segregate potentially hazardous waste from non-hazardous construction site debris.
- ☐ Keep solid waste materials under cover in either a closed dumpster or other enclosed trash container that limits contact with rain and runoff.
- ☐ Store waste materials away from drainage ditches, swales and catch basins.
- ☐ Do not allow trash containers to overflow.
- ☐ Do not allow waste materials to accumulate on the ground.
- ☐ Prohibit littering by workers and visitors.
- ☐ Police area daily for litter and debris.
- ☐ Enforce solid waste handling and storage procedures.

Disposal Procedures
- ☐ If feasible, segregate recyclable wastes from non-recyclable waste materials and dispose of properly.
- ☐ General construction debris may be hauled to a licensed construction debris landfill (typically less expensive than a sanitary landfill).
- ☐ Use waste facilities approved by local jurisdiction.
- ☐ Runoff which comes into contact with unprotected waste shall be directed into structural be dirt treatment such as silt fence to remove debris.

Education
- ☐ Educate all workers on solid waste storage and disposal procedures.
- ☐ Instruct workers in identification of solid waste and hazardous waste.
- ☐ Have regular meetings to discuss and reinforce disposal procedures (incorporate in regular safety seminars).
- ☐ Clearly mark on all solid waste containers which materials are acceptable.

Quality Control
- ☐ Foreman and/or construction supervisor shall monitor on-site solid waste storage and disposal procedures.
- ☐ Discipline workers who repeatedly violate procedures.

Requirements
- ☐ Job-site waste handling and disposal education and awareness program.
- ☐ Commitment by management to implement and enforce Solid Waste Management Program.
- ☐ Compliance by workers.
- ☐ Sufficient and appropriate waste storage containers.
- ☐ Timely removal of stored solid waste materials.
- ☐ Possible modest cost impact for additional waste storage containers.
- ☐ Minimal overall cost impact.

LIMITATIONS
Only addresses non-hazardous solid waste.
One part of a comprehensive construction site management program.

Applications: Perimeter Control; Slope Protection; Sediment Trapping; Channel Protection; Temporary Stabilization; Permanent Stabilization; **Waste Management**; **Housekeeping Practices**

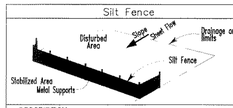
Targeted Constituents: ○ Sediment; ● Nutrients Toxic Materials; ○ Oil & Grease; ● Floatable Materials; ● Other Construction Wastes

Implementation Requirements: ◒ Capital Costs; ◒ Maintenance; ◒ Training; ○ Suitability for Slopes > 5%

Legend: ◒ Significant Impact; ◒ Medium Impact; ○ Low Impact; ? Unknown or Questionable Impact

W-1

Silt Fence



DESCRIPTION
A silt fence consists of geotextile fabric supported by poultry netting or other backing stretched between wooden or metal posts with the lower edge of the fabric securely embedded in the soil. The fence is typically located downstream of disturbed areas to intercept runoff in the form of sheet flow. Silt fence provides both filtration and time for sedimentation to reduce sediment and it reduces the velocity of the runoff. Properly designed silt fence is economical since it can be re-located during construction and re-used on other projects.

PRIMARY USE
Silt fence is normally used as perimeter control located downstream of disturbed areas. It is only feasible for non-concentrated, sheet flow conditions.

APPLICATIONS
Silt fence is an economical means to treat overland, non-concentrated flows for all types of projects. Silt fences are used as perimeter control devices for both site developments and linear (roadway) type projects. They are most effective with coarse to silty soil types. Due to the potential of clogging, silt fence should not be used with clay soil types.

In order to reduce the length of silt fence, it should be placed adjacent to the down slope side of the construction activities.

- ☐ elevation (along a contour line) where possible.
- ☐ Maximum slope adjacent to the fence is 1:1
- ☐ Maximum distance of flow to silt fence should be 200 feet or less.
- ☐ Maximum concentrated flow to silt fence shall be 1 CFS per 20 feet of fence.
- ☐ If 50% or less of soil, by weight, passes the U.S. Standard sieve No. 200, select the equivalent opening size (E.O.S.) to retain 85% of the soil.
- ☐ Maximum equivalent opening size shall be 70 (#70 sieve).
- ☐ Minimum equivalent opening size shall be 100 (#100 sieve).
- ☐ If 85% or more of soil, by weight, passes the U.S. Standard sieve No. 200, silt fences shall not be used due to potential clogging.
- ☐ Sufficient room for the operation of sediment removal equipment shall be provided between the silt fence and other obstructions in order to properly maintain the fence.
- ☐ The ends of the fence shall be turned upstream to prevent bypass of stormwater.
  bypass of stormwater.

LIMITATIONS
Minor ponding will likely occur at the upstream side of the silt fence resulting in minor flooding.

Fences which are constructed in swales or low areas subject to concentrated flow may be concentrated overtopped resulting in failure of the filter fence. Silt fences subject to areas of concentrated flow (waterways with flows > 1 cfs) are not acceptable.

Silt fence can interfere with construction operations, therefore planning of access routes onto the site is critical.

Silt fence can fail structurally under heavy storm flows, creating maintenance problems and reducing the effectiveness of the system.

MAINTENANCE REQUIREMENTS
Inspections should be made on a weekly basis, especially after large storm events. If the fabric becomes clogged, it should be cleaned or if necessary, replaced.

Sediment should be removed when it reaches approximately one-half the height of the fence.

Applications: **Perimeter Control**; Slope Protection; **Sediment Trapping**; Channel Protection; Temporary Stabilization; Permanent Stabilization; Waste Management; Housekeeping Practices

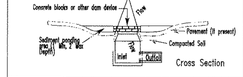
Targeted Constituents: ● Sediment; ○ Nutrients Toxic Materials; ○ Oil & Grease; ● Floatable Materials; ○ Other Construction Wastes

Implementation Requirements: ◒ Capital Costs; ● Maintenance; ○ Training; ◒ Suitability for Slopes > 5%

Legend: ◒ Significant Impact; ● Medium Impact; ○ Low Impact; ? Unknown or Questionable Impact

Fe=0.75
S-1

Inlet Protection



DESCRIPTION
Inlet protection consists of a variety of methods of intercepting sediment at low point inlets through the use of stone, filter fabric and other materials. This is normally located at the inlet, providing either detention or filtration to reduce sediment and floatable materials in storm water.

PRIMARY USE
Inlet protection is normally used as a secondary defense in site erosion control due to its limited effectiveness and applicability of the technique. It is normally used in new developments that include new inlets or roads with new curb inlets or during major repairs to existing roadways. Inlet protection has limited use in developed areas due to the potential for flooding, traffic safety and pedestrian safety and maintenance problems. Inlet protection can reduce sediment in storm sewer system by serving as a back up system to on-site controls or by reducing sediment loads from controls with limited effectiveness such as straw bale dikes.

APPLICATIONS
Different variations are used for different conditions as follows:

- ☐ Filter barrier protection (similar to a silt fence barrier around the inlet) is appropriate when the drainage area is less than five (5) percent. This type of protection is not applicable in paved areas. (See details, Section 9)
- ☐ Block and gravel (crushed stone, recycled concrete is also appropriate) protection is used when flows exceed 0.5 cfs and it is necessary to allow for overtopping to prevent flooding (See sketch at top of fact sheet).
- ☐ Wire mesh and gravel protection (crushed stone, recycled concrete is also appropriate) is used when flows exceed 0.5 cfs and construction traffic may occur over the inlet. This form of protection may be used with both curb and drop inlets (See details Section 9).
- ☐ Excavated impoundment protection around a drop inlet may be used for protection against sediment entering a storm orain system. With this method, it is necessary to install weep holes to allow the impoundment to drain completely. The impoundment shall be sized such that the volume of excavation shall be equal to 1800 to 3600 cubic feet per acre of contributing drainage area entering the inlet for full effectiveness. Smaller volumes can be used for reduced effectiveness (SEE details Section 9).

Filter fabric protection shall be designed and maintained in a manner similar to silt fence.
- ☐ Maximum depth of flow shall be (8) eight inches or less depending on vehicular and pedestrian traffic.
- ☐ Positive drainage is critical in the design of inlet protection. If overflow is not provided for at the inlet, flows which exceed the capacity of the inlet protection system shall be routed through established swales, streets or other watercourses to minimize damage due to ponding and to provide for public safety.

LIMITATIONS
Ponding will occur at the inlet with possible flooding as a result.

Inlet protection is only viable at low point inlets. Inlets which are on a slope cannot be effectively protected because storm water will bypass the inlet and continue downstream, causing an overload condition at inlets beyond.

MAINTENANCE REQUIREMENTS
Inspections should be made on a weekly basis, especially after large (>0.5 inches) storm events. When silt fence is used and the fabric becomes clogged, it should be cleaned or if necessary, replaced. Also, sediment should be removed when it reaches approximately one-half the height of the fence. If a sump is used, sediment should be removed when the volume of the basin is reduced by 50%.

For systems using stone filters, when the stone filter becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill material and put new stone around the inlet.

Applications: Perimeter Control; Slope Protection; **Sediment Trapping**; Channel Protection; Temporary Stabilization; Permanent Stabilization; Waste Management; Housekeeping Practices

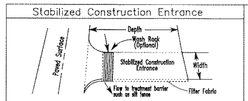
Targeted Constituents: ● Sediment; ○ Nutrients Toxic Materials; ○ Oil & Grease; ● Floatable Materials; ● Other Construction Wastes

Implementation Requirements: ● Capital Costs; ● Maintenance; ○ Training; ○ Suitability for Slopes > 5%

Legend: ● Significant Impact; ● Medium Impact; ○ Low Impact; ? Unknown or Questionable Impact

Fe=0.67-0.75
S-4

Stabilized Construction Entrance



DESCRIPTION
A stabilized construction entrance consists of a pad consisting of gravel, crushed stone, recycled concrete or other rock like material on top of geotextile filter cloth to facilitate the wash down and removal of sediment and other debris from construction equipment prior to exiting the construction site. For added effectiveness, a wash rack area can be incorporated into the design to further reduce sediment tracking. For long term projects, cattle guards or other type of permanent rock system can be used in conjunction with a wash rack. This directly addresses the problem of silt and mud deposition in roadways used for construction site access.

PRIMARY USE
Stabilized construction entrances are used primarily for sites in which significant truck traffic occurs on a daily basis. It reduces the need to remove sediment from streets. If used properly, it also directs the majority of traffic to to a single location, reducing the number and quantity of disturbed areas on the site and providing protection for other structural controls through traffic control.

APPLICATIONS
Stabilized construction entrances are a required part of the erosion control plan for all site developments larger than 5 acres and a recommended practice for all construction sites. It is not suitable for long, linear projects. If possible, small entrances should be incorporated into small lot construction due to the large percentage of disturbed area on the site and the high potential for offsite tracking of silt and mud.

DESIGN CRITERIA
- ☐ Stabilized construction entrances are to be constructed such that drainage across the entrance is directed to a controlled, stabilized outlet on site with provisions for storage, proper filtration and removal of wash water.
- ☐ The entrance must be properly graded so that storm water is not allowed to leave the site and enter roadways.
- ☐ Minimum width of entrance shall be 15 feet, but in no case shall the width be less than that of the entry way to be used.
- ☐ Minimum depth of entrance shall be 12 inches for the entire length of the control.
- ☐ Minimum dimensions for entrances of tract areas less than 1 acre shall be an average lot depth of 100 feet with a minimum entrance width of 15 feet and a minimum entrance depth of 20 feet.
- ☐ No crushed concrete allowed – 3" to 5" rock required.

LIMITATIONS
Selection of the construction entrance location is critical in that to be effective, it must be used exclusively.

Stabilized entrances are rather expensive considering that it must be installed in combination with one or more other sediment control techniques, but it may be cost effective compared to labor intensive street cleaning.

MAINTENANCE REQUIREMENTS
Inspections should be made on a regular basis and after large storm events in order to ascertain whether or not sediment and pollution are being effectively detained on site.

When sediment has substantially clogged the void area between the rocks, the aggregate mat must be washed down or replaced.

Periodic re-grading and top dressing with additional stone must be done to keep the efficiency of the entrance from diminishing.

Applications: Perimeter Control; Slope Protection; Sediment Trapping; Channel Protection; **Temporary Stabilization**; Permanent Stabilization; Waste Management; Housekeeping Practices

Targeted Constituents: ◒ Sediment; ○ Nutrients Toxic Materials; ○ Oil & Grease; ○ Floatable Materials; ○ Other Construction Wastes

Implementation Requirements: ◒ Capital Costs; ◒ Maintenance; ○ Training; ○ Suitability for Slopes > 5%

Legend: ◒ Significant Impact; ◒ Medium Impact; ○ Low Impact; ? Unknown or Questionable Impact

Fe=N/A
S-9

Concrete Waste Management

DESCRIPTION
Concrete waste at construction sites comes in two forms; 1)excess fresh concrete mix including truck and equipment washing, and 2) concrete dust and concrete debris resulting from demolition. Both forms have the potential to impact water quality through storm water runoff contact with the waste.

PRIMARY USE
Concrete waste is present at most construction sites. This BMP should be utilized at sites in which concrete waste is present.

APPLICATIONS
A number of water quality parameters can be affected by introduction of concrete – especially fresh concrete. Concrete affects the pH of runoff, causing significant chemical changes in water bodies and harming aquatic life. Suspended solids in the form of both cement and aggregate dust are also generated from both fresh and demolished concrete waste.

Current Unacceptable Waste Concrete Disposal Practices
- ☐ Dumping in vacant areas on the job-site.
- ☐ Illicit dumping off-site.
- ☐ Dumping into ditches or drainage facilities.

Recommended Disposal Practices
- ☐ Avoid unacceptable disposal practices listed above.
- ☐ Develop pre-determined, safe concrete disposal areas.
- ☐ Provide a washout area with a minimum of 6 cubic feet of containment area volume for every 10 cubic yards of concrete poured.
- ☐ Never dump waste concrete illicitly or without property owners knowledge and consent.
- ☐ Treat runoff from storage areas through the use of structural controls as required.

Education
- ☐ Drivers and equipment operators should be instructed on proper disposal and equipment washing practices (see above).
- ☐ Supervisors must be made aware of the potential environmental consequences of improperly handled concrete waste.

Enforcement
- ☐ The construction site manager or foreman must ensure that employees and pre-mix companies follow proper procedures for concrete disposal and equipment washing.
- ☐ Employees violating disposal or equipment cleaning directives must be re-educated or disciplined if necessary.

Demolition Practices
- ☐ Monitor weather and wind direction to ensure concrete dust is not entering drainage structures and surface waters. Where appropriate, construct sediment traps or other types of sediment detention devices downstream of demolition activities.

Requirements
- ☐ Use pre-determined disposal sites for waste concrete.
- ☐ Prohibit dumping waste concrete anywhere but pre-determined areas.
- ☐ Assign pre-determined truck and equipment washing areas
- ☐ Educate drivers and operators on proper disposal and equipment cleaning procedures.

Education
- ☐ Minimal cost impact for training and monitoring.
- ☐ Concrete disposal cost depends on availability and distance to suitable disposal areas.
- ☐ Additional costs involved in equipment washing could be significant.

LIMITATIONS
This concrete waste management program is one part of a comprehensive construction site waste management program.

Applications: Perimeter Control; Slope Protection; Sediment Trapping; Channel Protection; Temporary Stabilization; Permanent Stabilization; **Waste Management**; **Housekeeping Practices**

Targeted Constituents: ○ Sediment; ● Nutrients Toxic Materials; ○ Oil & Grease; ● Floatable Materials; ● Other Construction Wastes

Implementation Requirements: ◒ Capital Costs; ◒ Maintenance; ◒ Training; ○ Suitability for Slopes > 5%

Legend: ◒ Significant Impact; ◒ Medium Impact; ○ Low Impact; ? Unknown or Questionable Impact

W-3

ALLOWABLE NON-STORM WATER DISCHARGES

- DISCHARGES FROM FIRE FIGHTING ACTIVITIES.
- FIRE HYDRANT FLUSHINGS. *
- WATER USED TO WASH VEHICLES OR CONTROL DUST.
- POTABLE WATER SOURCES (INCLUDING WATERLINE FLUSHINGS CONTAINING LESS THAN 1000 GALLONS). *
- UNCONTAMINATED GROUND WATER (INCLUDING DEWATERING GROUNDWATER INFILTRATION).
- FOUNDATION OR FOOTING DRAINS WHERE FLOWS ARE NOT CONTAMINATED WITH PROCESS MATERIALS SUCH AS SOLVENTS.
- SPRINGS, RIPARIAN HABITATS, WETLANDS AND UNCONTAMINATED GROUNDWATER.
- IRRIGATION WATER.
- EXTERIOR BUILDING WASH DOWN WITHOUT DETERGENTS.
- PAVEMENT WASH WATERS WHERE SPILLS OR LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED (UNLESS ALL SPILL MATERIAL HAS BEEN REMOVED) AND WHERE DETERGENTS ARE NOT USED.
- AIR CONDITIONING CONDENSATE.

* HEAVILY CHLORINATED WATER (3.5 MG/L OR GREATER FREE CHLORINE) RESULTING FROM WATER LINE STERILIZATION SHALL BE DIRECTED UNDER PERMIT TO THE SANITARY SEWER UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL APPLY TO THE ENGINEERING DEPARTMENT FOR A SANITARY SEWER DISCHARGE PERMIT AFTER THE MANDATORY CHLORINE RETENTION TIME (USUALLY 24 HOURS). THE HEAVILY CHLORINATED WATER MAY BE DISCHARGED TO THE SANITARY SEWER, BEGINNING TWO WORKING DAYS AFTER PERMIT APPLICATION.

Legend

- SF Silt Fence
- Limits of Construction
- Property Boundary
- 600 Elevation Contours
- Building Building Foot Print
- T Covered Trash
- Direction of Storm Water Runoff Flow
- S Covered Storage
- Vegetated/Preserved Buffer Strip
- Concrete Wash Area
- Inlet Protection
- North Arrow
- Stabilized Construction Entrance
- ☐ Rock ☐ Daily Mulch
- ☐ Swale ☐ Other (Specify)
- ☐ Erosion Mat

MAINTENANCE AND INSPECTION PROCEDURES: CONTROL MEASURES WILL BE INSPECTED AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF ANY STORM EVENT OR 0.5 INCHES OR GREATER. IF A REPAIR IS NECESSARY IT WILL BE DONE AT THE EARLIEST PRACTICABLE DATE BUT WITHIN 48 HOURS.

RECORD DRAWING

This is to certify that changes and corrections have been made to conform to the contractor's record of this project.

Signed _____ Date 8.4.09

Glenn Engineering Corporation

SHWGROUP
ARCHITECTS | ENGINEERS | PLANNERS

Consultants:

CIVIL:
GLENN ENGINEERING CORP

STRUCTURAL:
SHW GROUP, LLP

MEP:
ESTES McCLURE & ASSOCIATES, INC.

FOOD SERVICE:
JMK FOODSERVICE CONSULTING & DESIGN, LLC

LANDSCAPING:
RAMSEY LANDSCAPE ARCHITECTS, LLP

Final Plans for Bidding and Construction

STATE OF TEXAS
MIKE GLENN
35059
REGISTERED
PROFESSIONAL
ENGINEER
8.4.09

Rockwall INDEPENDENT SCHOOL DISTRICT

WILKERSON SANDERS STADIUM RENOVATIONS

ROCKWALL, TEXAS

Project Number: 4107.048.00
Drawing Date: 05/29/2008
Drawn:
Checked:
Scale:
ACAD File: 2008WILKERSON-SANDERS-DETAIL

Revisions:

1	11/05/08	CITY REVISIONS
2	12/02/08	CITY REVISIONS #2
3	12/12/08	CITY REVISIONS #3
4	12/16/08	CITY REVISIONS #4
5	01/26/09	CITY REVISIONS #5
6	08/03/09	RECORD SET

Sheet Title:
SWPPP DETAILS

CG 1.12