PART 1- GENERAL

1.1 DEFINITIONS

1.1.1 BMP – Best Management Practices.

1.1.2 NOI & NOT – Notice of Intent and Notice of Termination for TPDES permits.

1.1.3 SWPPP – Storm Water Pollution Prevention Plan

1.1.4 TCEQ – Texas Commission on Environmental Quality.

1.1.5 TPDES – Texas Pollutant Discharge Elimination System

1.1.6 Large Construction Activities – Construction activities including clearing, grading and excavating that result in land disturbance of equal to or greater than five (5) acres

1.1.7 Small Construction Activities - Construction activities including clearing, grading and excavating that result in land disturbance of equal to or greater than one (1) acre and less than five (5) acres of land.

1.1.8 MS4 – Municipal Separate Storm Sewer Systems: The City of Houston is the MS4 operator for MD Anderson’s Houston Campus.

1.1.9 SWQMP – Storm Water Quality Management Plan

1.1.10 EH&S – MD Anderson Cancer Center’s Environmental Health and Safety Department

1.2 RELATED DOCUMENTS AND APPLICABLE WORK

1.2.1 The TCEQ TPDES Construction General Permit No. TXR150000, March 5, 2008 and the project SWPPP. This specification requires compliance with all provisions of the TCEQ with regards to the TPDES permit. The TCEQ requirements currently pertain to large construction activities of five (5) acres or more and small construction activities which disturb one (1) to less than five (5) acres.

1.2.2 “The Storm Water Management Handbook for Construction Activities” developed by the City of Houston, Harris County and Harris County Flood Control District. The handbook provides information to engineers and contractors about TCEQ’s TPDES General Permit requirements and about the City of Houston Ordinance Chapter 47 Article XII. The Ordinance has established rules to reduce construction-related pollutants in storm water runoff and effectively prohibit non-storm water discharges to the local storm sewer system.

1.2.3 Information to Respondents, Agreement, Uniform General Conditions for University of Texas System Building Construction Contracts (UGC) and Special Conditions shall be carefully read for provisions pertaining to this Work. In the event of conflict, the better quality or greater quantity shall prevail.

1.2.4 The Work described in this Section is applicable to any and all Sections of the Contract Documents. Any and all Work that would disturb the existing Site conditions or present the potential for site run-off shall adhere fully to this Specification Section.

1.2.5 Unless specifically notified to the contrary by the Owner, in writing, all aspects of this specification shall apply to this Project.
1.3 CONTRACTOR RESPONSIBILITIES

1.3.1 This project requires implementation of storm water “Best Management Practices” (BMP) for control devices and monitoring by the Contractor to comply with all provisions of the Storm Water Pollution Prevention Plan (SWPPP) developed for the Project by the licensed civil engineer. The Contractor must fulfill all Texas Pollutant Discharge Elimination System (TPDES) regulatory requirements, including the filing of a NOI and NOT and/or signing and posting of the Site Notices.

1.3.2 The Contractor shall provide signatures of a corporate Officer for the NOI, Site Notice, and NOT and any other forms or applications as required by the TPDES General Permit TXR150000. The Contractor shall also provide delegated authorization to sign reports per 30 TAC 305.128. Individuals conducting site inspections shall be qualified to the satisfaction of the Owner. Documented qualifications shall be included in the SWPPP booklet.

1.3.3 When the Contractor receives the approved SWPPP from the Owner, the Contractor signs the NOI and Site Notice (see Sample form in Part 4 of this Section) and forwards the NOI and Site Notice to the Owner. Two separate $325 application fees (one for the Owner and one for the Contractor) must accompany the NOI. The Owner signs his NOI and sends both NOI’s and application fees to TCEQ. The Contractor shall insert a copy of the signed NOI or Site Notice into the SWPPP booklet to be kept at the Project Site. The $325 application fees are not required for Small Construction Sites.

1.3.4 The SWPPP booklet kept at the Project Site shall also contain the following:

1.3.4.1 A letter delegating signature authority to the field personnel for both the Contractor and the Owner.
1.3.4.2 A copy of TPDES permit when received.
1.3.4.3 A copy of the Site Notice (Large Construction Site Notice or Small Construction Site Notice for both the Primary and Secondary Operators).

1.3.5 The Contractor shall review the SWPPP and verify existing conditions at the Site before determining scope of implementation of site controls. Site survey and site plan drawings shall be used for additional reference. The Contractor shall notify the Owner, in advance, of this site review to allow for Owner participation.

1.3.6 The Contractor shall construct a Project SWPPP sign and place it at the main entrance to the Project Site. This sign shall include the NOI and TPDES permit along with the TCEQ TPDES Site Notice. The sign shall be constructed as detailed in the sample SWPPP sign drawing included in Part 4 of this Section.

1.3.7 The Contractor shall contact the Owner’s Designated Representative from the EH&S department for review of initial site controls in place prior to commencing site-disturbing activities, to ensure that any unusual circumstances or unforeseen site conditions with regard to erosion and sedimentation have been addressed. The Contractor shall complete the SWPPP Project Start-up form (see Sample in Part 4 of this Section) and review it with the Owner before commencing soil disturbing activities. Both parties shall sign this form when the requirements listed in the SWPPP Project Start-up form have been met.

1.3.8 The Contractor shall provide all material, labor, equipment and services required to implement, maintain and monitor all erosion and sedimentation controls in compliance with the Storm Water Pollution Prevention Plan (SWPPP). All controls implemented by the Contractor shall comply with the Texas Pollutant Discharge Elimination System (TPDES) regulations as issued by the Texas Commission on Environmental Quality (TCEQ) on March 5, 2008. These controls shall remain in operation until project
completion and reestablishment of the Site or longer as directed by the Owner’s Designated Representative. The work shall include, but not be limited to the following:

1.3.8.1 All earthwork as required to implement swales, dikes, basins and other excavations for temporary routing of utilities, to protect against erosion or sediment-laden (“polluted”) storm water runoff.
1.3.8.2 All structural controls as shown or specified, including silt fences, sediment traps, stabilized construction entrance, subsurface drains, pipe slope drains, inlet/outlet protection, reinforced soil retention, gabions, rock berms, etc.
1.3.8.3 All non-structural controls as shown or specified, including temporary or permanent vegetation, mulching, geotextiles, sod stabilization, preservation of vegetative buffer strips, preservation/protection of existing trees and other mature vegetation.
1.3.8.4 All modifications and revisions to SWPPP necessary to meet changing site conditions and to address new sources of storm water discharges, as the work progresses.
1.3.8.5 All maintenance and repair of structural and non-structural controls in place shall continue until final stabilization is achieved or as directed by the Owner’s Designated Representative.
1.3.8.6 Weekly site inspections, as required by the SWPPP, of pollutant sources, including hazardous sources, structural and non-structural controls, and all monitoring of SWPPP revisions and maintenance of inspection records.
1.3.8.7 Removal of all structural and non-structural controls as necessary upon completion, and only after final stabilization is achieved.
1.3.8.8 Filing of Notice of Termination (NOT) with the TECQ within 30 days of final stabilization being achieved, or of another Operator assuming control of the unstabilized portions of the Site.
1.3.8.9 Refer to the SWPPP for additional requirements to ensure compliance with TPDES regulations.

1.3.9 Certain construction activities such as the construction of underground stormwater conveyance and/or structural control systems at a construction site may require a Stormwater Quality Management (SWQ) permit from the City of Houston’s Public Works & Engineering Department. The Contractor is responsible for applying for the SWQ permit, renewing the permit on an annual basis, operating and maintaining these systems according to the manufacturer’s recommendations and industrial standards. Upon the completion of the construction activities, the Contractor shall transfer the ownership of the SWQ permit and associated documents such as engineering drawings and maintenance record to the owner.

1.4 QUALITY ASSURANCE

1.4.1 In order to minimize the discharge of pollutants to storm water, the Contractor shall implement all permanent and temporary Site controls according to Texas Pollutant Discharge Elimination System (TPDES) Guidelines, as set forth by the Texas Commission on Environmental Quality.

1.4.2 Implementation of site controls shall be performed by a qualified contractor experienced in the proper installation of such devices in accordance with manufacturers’ specifications, and in keeping with recognized Best Management Practices (BMP’s), and in keeping with TPDES regulations. Qualification of installing Contractor shall be reviewed with the Owner prior to entering into a contract with them for services.

1.4.3 The Contractor shall inspect all BMP’s at regular intervals as specified in the Storm Water Pollution Prevention Plan for this project. Use standard Owner Inspection forms (see form in Part 4 of this Section) for each inspection. Record all deficiencies of site controls, and take immediate action to correct any deficiencies recorded. Keep records of inspections current and on file, available for review by EPA, TCEQ, MS4 operator and Owner.

1.5 SUBMITTALS
1.5.1 Submittals of products used in structural and non-structural controls shall be made through established procedures for review and approval by the Owner prior to installation on the Site. The Contractor shall make available physical samples and product literature on any material used in structural or non-structural controls during the course of the Project prior to its implementation in the field.

PART 2 - PRODUCTS

2.1 MATERIALS

Specific site control devices are identified in the SWPPP. Where such devices are indicated, their material composition shall comply with this Section.

2.1.1 Materials to be used in structural and non-structural site controls shall include, but not be limited to the following:

2.1.1.1 Silt Fences: implemented to filter, and remove sediment from storm water shall be composed of the following materials:

   a. Geotextile fabric – a non-woven, polypropylene, polyethylene, or polyamide fabric with non-raveling edges. It shall be non-biodegradable, inert to most soil chemicals, ultraviolet resistant, unaffected by moisture and other weather conditions, and permeable to water while retaining sediment. Fabric shall be 36 inches wide, with a minimum weight of 4.5 oz/yd.

   b. Posts – steel fence posts shall be made of hot rolled steel, galvanized or painted, a minimum of 4 feet long, with a Y-bar or TEE cross-section of sufficient strength to withstand forces implied.

   c. Wire Backing – a galvanized, 2"x4", welded wire fencing, 12 gauge minimum. Width shall be sufficient to support geotextile fabric 24 inches above adjacent grades. Chain link fences located along the same lines as silt fences, may be use to support geotextile fabric. In this circumstance, the geotextile fabric shall be firmly attached to fence.

2.1.1.2 Triangular Filter Dikes: for use on surfaces or in locations where standard silt fence cannot be implemented, shall be composed of the following:

   a. Geotextile fabric - a non-woven, polypropylene, polyethylene, or polyamide fabric with non-raveling edges. It shall be non-biodegradable, inert to most soil chemicals, ultraviolet resistant, unaffected by moisture and other weather conditions, and permeable to water while retaining sediment. Fabric shall be 36 inches wide, with a minimum weight of 4.5 oz/yd.

   b. Dike Structure - 6 gauge, 6x6 welded wire mesh, 60 inches wide, folded into a triangular form. Each side shall be 18 inches with an overlap of 6 inches.

   c. Ties – metal shoat rings or standard wire/cable ties for attachment of wire mesh to itself, and for attachment of geotextile fabric to wire mesh.

2.1.1.3 Stabilized Construction Exit: A steel grid that allows the safe passage of vehicles while agitating the tires to loosen and remove the soil build up. The grid or structures shall conform to the following:

   a. It shall consist of pipes or tubes spaced such that there is a minimum clear distance between the pipes or tubes of 4 ½ inches. It shall be
The area beneath the grid shall be sloped such that debris, soil and water shall be diverted back on to the construction site or to a sediment basin. No water, soil or debris shall leave the construction site. The resulting discharge shall be disposed of properly.

2.1.1.4 **Rock Berms**: shall be composed of the following materials:

a. Rock – clean open graded rock, with a maximum diameter of 3 inches.
b. Wire Mesh Support – a galvanized, woven wire sheathing having a maximum opening size of 1 (one) inch, and a minimum wire diameter of 20 gauge.
c. Ties – metal shot rings or standard wire/cable ties.

d. The area beneath the grid shall be sloped such that debris, soil and water shall be diverted back on to the construction site or to a sediment basin. No water, soil or debris shall leave the construction site. The resulting discharge shall be disposed of properly.

2.1.1.5 **Concrete Truck Washout** (self installed): shall be used for containment of fluids from concrete truck washout wastes.

a. Gravel bags, concrete blocks or open graded rock
b. 10 mil plastic sheeting

c. The area beneath the grid shall be sloped such that debris, soil and water shall be diverted back on to the construction site or to a sediment basin. No water, soil or debris shall leave the construction site. The resulting discharge shall be disposed of properly.

2.1.1.6 **Temporary Storage Tanks**: shall be used for temporary storage of fuels on the construction Project Site

a. 2 inches of sand on the bottom of the containment area
b. 6 mil plastic sheeting
c. 2 inches of sand on top of the plastic sheeting

d. The area beneath the grid shall be sloped such that debris, soil and water shall be diverted back on to the construction site or to a sediment basin. No water, soil or debris shall leave the construction site. The resulting discharge shall be disposed of properly.

2.1.1.7 **Erosion Control Matting**: shall be used on steep slopes, in drainage swales, and in high traffic pedestrian areas of barren soil. It shall include one or more of the following:

a. Jute Mat – a plain fabric made of jute yarn, woven in a loose and simple manner, with a minimum unit weight of 2.7 pounds per square yard. Width shall be as required for the dimensions of the area to be covered.
b. Wood Fiber Mat – a mat composed of wood fibers, which are encased in nylon, cotton or other type of netting.
c. Synthetic Webbing Mat – a mat manufactured from polyvinyl chloride or polypropylene monofilaments, which are bonded together into a three-dimensional web to facilitate erosion control and/or re-vegetation.
2.1.1.8 **Organic Mulches**: shall be used for covering bare soil, retaining moisture under existing vegetation being preserved, and for absorbing the energy of compaction caused by foot or vehicular traffic. Mulch shall be one or more of the following:

- **Straw** – from broken straw bales that are free of weed and grass seed where the grass from the seed is not desired vegetation for the area to be protected.
- **Wood Chips** – from chipped limbs of cleared trees on site, or delivered in chipped form, in bulk quantities of pine, cedar or cypress. Wood chips of all species shall be partially decomposed to alleviate nitrogen depletion of the soil in areas where existing vegetation is to be preserved and protected.
- **Shredded Mulches** – from pine, cypress or cedar, mechanically shredded, and capable of forming an interlocking mat following placement, and after sufficient wetting and drying has taken place naturally.

2.1.1.7 Any other materials indicated in SWPPP.

**PART 3- EXECUTION**

3.1 **GENERAL**

3.1.1 The Contractor shall provide a complete installation of all site control devices and measures (BMPs). Indicated in the SWPPP booklet, including the Site Erosion and Sedimentation Control Drawing and as specified herein. These BMPs must be confirmed as fully operational with the Owner before any Work that disturbs the Site can begin.

3.1.2 The Contractor shall provide all inspection and monitoring of controls in place and shall perform all revisions and updating of SWPPP booklet. An accurate, chronological record of all Contractor inspections revisions and additional controls shall be kept on file at the project Site, for review, with a copy of the SWPPP booklet.

3.1.3 The Contractor shall submit their Notice of Termination (NOT) to the TCEQ, with a copy to the Owner, after all disturbed areas are re-established (stabilized) with vegetative cover following completion of construction. Following acceptance of stabilized areas, all site controls that are no longer necessary shall be removed.

3.2 **CONTROL DEVICES**

Execution of specific site control devices is described in the following paragraphs. Refer to the SWPPP for applicable devices, extent and location.

3.2.1 **SILT FENCE**

3.2.1.1 Silt fences shall consist of non-woven geotextile fabric, attached to wire fabric backing to support the geotextile. The wire fabric should be galvanized 2” x 4” welded wire, 12-gauge minimum. Attach non-woven geotextile fabric to fence with shoot or standard cable/wire ties, leaving a “toe” of fabric at the bottom of the fence of not less than 6 (six) inches. Steel posts as specified shall be driven to a depth of 1 (one) foot minimum, and spaced not more than 6 (six) feet on center. Tilt posts slightly, in an “uphill” direction for additional strength. Attach fencing to posts with standard cable/wire ties. Dig a 6 (six) inch deep by 6 (six) inch wide trench on the disturbed side of the fence, bury geotextile fabric in trench, backfill and tamp. Abutting ends of geotextile fabric shall be overlapped a minimum of 12 (twelve) inches.

3.2.1.2 Maintain silt fence daily as necessary to repair breaches in geotextile fabric. Maintain steel posts as specified in tilted condition. When siltation has occurred, it shall be
removed when it has reached a depth of 6 (six) inches. Silt that has been removed shall be disposed of off-site.

3.2.1.3 Remove silt fence when the disturbed areas protected by silt fence have been completely stabilized as specified. Minimize site disturbance while removing silt fence and posts.

3.2.2 CURB INLET PROTECTION

3.2.2.1 Cover curb storm inlet with non-woven geotextile fabric covered wire fabric. Wire fabric to be 2"X4" – W1.4XW1.4. Extend fabric 2 (two) feet beyond inlet opening at each end and 12" (twelve) in front of opening in the gutter. Remove strip of filter fabric apx. 2 1/2" (two and one half) high for the length of the protection to act as overflow. Extend fabric over the top of opening to allow placement of gravel bags. Anchor fabric with 20 lb. gravel bags placed 3 (three) feet on center.

3.2.2.2 Maintain inlet protection daily as necessary to repair breaches in geotextile fabric. When siltation has occurred, it shall be removed when it has reached a depth of 2 (two) inches. Silt that has been removed shall be disposed of off-site.

3.2.3 STABILIZED CONSTRUCTION EXIT

3.2.3.1 A steel grid that allows the safe passage of vehicles while agitating the tires to loosen and remove the soil build-up. The grid or structures shall conform to the following:

a. It shall consist of pipes or tubes spaced such that there is a minimum clear distance between the pipes or tubes of 4-½ inches. It shall be elevated above the ground surface a minimum of 8 inches to allow water, debris and soil to drain.

b. Minimum diameter of pipe or tube shall be 3 inches.

c. It shall be designed to support any and all vehicles entering and leaving the construction site.

d. It shall be firmly placed in the ground at the exit.

e. It shall be of sufficient length so that the agitation will remove the soil from the tires or a minimum of 8'-0".

f. At the "street side" approach of the grid there shall be an impervious surface or it shall consist of 3 to 5 inch diameter angular crushed stone/rock approximately 5'-0" in length, minimum, and 8 inches deep, minimum. On the "job site" side of the grid, there shall be 3 to 5 inch diameter angular crushed stone/rock 15'-0" in length, minimum 8 inches deep. The steel grid will be between the "street side" approach and the job site crushed stone/rock. All crushed stone/rock shall have filter fabric beneath the stone/rock. See diagram on Exhibit F.

g. Steel grid area shall be used as the tire wash area. When tire wash is in use (rainy or muddy days) the area shall be manned and the tires shall be washed using a high pressure hose/nozzle.

h. The area beneath the grid shall be sloped such that debris, soil and water shall be diverted back on to the construction site or to a sediment basin. No water, soil or debris shall leave the construction site. The resulting discharge shall be disposed of properly.

3.2.4 ROCK BERM

3.2.4.1 Rock berm shall consist of rip-rap type rock, secured within wire sheathing as specified, and installed at the toe of slopes, or at the perimeter of developing or disturbed areas. Height of berm shall be a minimum of 18 (eighteen) inches from top of berm to uphill toe of berm. Top width shall be a minimum of 24 (twenty four) inches, with side slopes of 2:1 or flatter. Uphill toe of berm shall be buried a minimum of 4 (four) inches into existing grade. Rock berm shall have a minimum flow-through rate of 60 (sixty) gallons per minute, per square foot of berm face.

3.2.4.2 Maintain rock berm in a condition that allows the sediment to be removed, when the depth of sediment has reached 1/3 (one third) the height of the berm. Berm shall be reshaped as needed, and silt buildup removed, to maintain specified flow through berm.
3.2.4.3 Rock berm shall be removed when the disturbed areas served have been stabilized as specified.

3.2.5 CONCRETE TRUCK WASHOUT (SELF INSTALLED)

3.2.5.1 Concrete Truck Washout (self installed) shall be constructed so that it will be able to accommodate the maximum number of anticipated concrete trucks that will be cleaned on any given day at any given time using 7 gallons of water being used for washout per truck or 50 gallons of water being used to wash out pump trucks. The area utilized to contain the wash water and concrete solids cleaned from the trucks will be a minimum of 10 feet in width. The containment area will be covered with 10 mil plastic sheeting without any holes or tears and the seams shall be sealed according to manufacturer’s recommendations. The gravel bags, concrete blocks or open graded rocks shall line the outside perimeter and shall be double wrapped with the 10 mil plastic sheeting to prevent any potential for runoff from the containment area.

3.2.5.2 The concrete truck washout containment area shall be maintained in a condition that will not allow concrete build up within the containment area to exceed 50 percent of the storage capacity.

3.2.5.3 Washout of concrete trucks during rainfall events shall be minimized.

3.2.5.4 If a SWPPP is required to be implemented, the SWPPP shall include concrete washout areas on the associated map.

3.2.5.5 The concrete truck washout area will be removed when it is no longer necessary to wash out concrete trucks on the site.

3.2.6 TEMPORARY STORAGE TANKS

3.2.6.1 Must be located in a bermed containment area. The berm must be a minimum 3 feet in all directions, and the height of the berm must contain the maximum contents of the largest tank plus 8 inches (approximately 110 percent of the tank capacity). The containment area is constructed by beginning with a 2 inch sand pad, and then covered with 6 mil plastic or rubber sheeting. The sheeting is then covered with another 2 inch layer of sand. The plastic sheeting is secured to the outer berm.

3.2.6.2 Storage tanks are to be placed no closer than 50 feet from a building or property line.

3.2.6.3 If using tanks with a gravity feed type set up, the containment must be of sufficient size to be able to contain the tank if it should fall over.

3.2.6.4 There must be a fusible link at the valve that will shut off the flow to the hose in the event of a fire.

3.2.6.5 There must be sufficient cover for the tank and the containment area to prevent potential stormwater runoff.

3.2.6.6 The area within the containment area is to be kept free and clear of spills, if a spill occurs then the sand is to be removed and replace with a fresh layer of sand.

3.2.6.7 The storage tank containment area is to be removed from the site once it has been determined that it will no longer be used on the construction site.

3.2.7 DIVERSION DIKE

3.2.7.1 Diversion dikes shall be formed and shaped using compacted fill, and shall not intercept runoff from more than 10 (ten) acres. Dike shall have a minimum top width of 24 (twenty
four) inches, and a minimum height of 18 (eighteen) inches. Soil shall have side slopes of 3:1 or flatter, and shall be placed in 8 (eight) inch lifts. Compact soil to 95 percent standard proctor density. Where protected slopes exceed 2 (two) percent, the uphill side of diversion dike shall be stabilized with crushed stone or erosion control matting – to a distance of not less than 7 (seven) feet from toe of dike. The channel, which is formed by the diversion dike, must have positive drainage for its entire length to a stabilized outlet, such as a rock berm, sandbag berm, or stone outlet structure. Storm water shall not be allowed to overflow the top of diversion dike at any point other than the stabilized outlet.

3.2.7.2 Maintain diversion dike in a condition that allows the storm water runoff to be diverted away from exposed slopes. Repair any failures at top of dike and remove sediment as necessary behind dike to allow positive drainage to a stabilized outlet.

3.2.7.3 Remove diversion dike when the expose slopes being protected are stabilized with vegetation or other permanent cover.

3.2.8 INTERCEPTOR SWALE

3.2.8.1 Interceptor swale shall be implemented to prevent on or off-site storm water from entering a disturbed area, or prevent sediment-laden runoff from leaving the Site or disturbed area. Interceptor swale shall be excavated as required by the SWPPP drawing/s, with side slopes of 3:1 or flatter. This shall include all labor and equipment associated with the installation and maintenance of the swale as shown on the construction documents. Constructed swale may be v-shaped or trapezoidal with a flat bottom, depending on the volume of water being channeled. Sediment laden runoff from swale shall be directed to a stabilized outlet or sediment-trapping device. Flow line of swale shall have a continuous fall for its entire length and shall not be allowed to overflow at any other point/s along its length.

3.2.8.2 Maintain interceptor swale in a condition that allows the storm water runoff to be channeled away from disturbed areas. Remove sediment in swale as necessary to maintain positive drainage to a stabilized outlet.

3.2.8.3 Fill in or remove swale after the disturbed area/s being protected are completely stabilized as specified.

3.2.9 EROSION CONTROL MATTING

3.2.9.1 Remove all rocks, debris, dirt clods, roots, and any other obstructions, which would prevent the matting from lying in direct contact with the soil. 6 inch by 6 inch anchor trenches shall be dug along the entire perimeter of the installation. Bury matting in trenches, backfill and compact. Fasten matting to the soil using 10 gauge wire staples, 6 inches in length and 1 inch wide. Use a minimum of one staple per 4 square feet of matting, and at 12 inches on center along all edges. Install parallel to flow of water and overlap joining strips a minimum of 12 inches.

3.2.9.2 Maintain erosion control matting by repairing any bare spots. Missing or loosened matting shall be promptly replaced or re-anchored.

3.2.9.3 Remove matting where protection is no longer required. In areas where permanent vegetation is established along with matting, matting can be left in place permanently.

3.2.10 MULCHES

3.2.10.1 Apply specified mulches in areas identified on the SWPPP, to a depth of 3 inches or as otherwise specified on the SWPPP drawing/s.

3.2.11 BPM DETAILS

3.2.11.1 Refer to Exhibits at the end of this Specification for the following BMP details:

3.2.6.1.1 Exhibit “A” Area Inlet Detail
3.2.6.1.2 Exhibit “B” Curb Inlet Detail
3.2.6.1.3 Exhibit “C” Rock Berm Detail
3.2.6.1.4 Exhibit “D” Silt Fence Detail
3.2.6.1.5 Exhibit “E” Triangular Dike Detail
3.2.6.1.6 Exhibit “F” Stabilized Construction Exit
3.2.6.1.7 Exhibit “G” Concrete Truck Washout

3.3 INSPECTIONS AND RECORD KEEPING

3.3.1 Contractor shall inspect all BMP’s on 7-day intervals and within 24-hours at the end of a major storm event totaling 0.5 inches of rainfall or greater, with the Owner’s Designated Representative, who is also required by TPDES to regularly inspect the site. Use standard Owner Inspection forms (see form in Part 4 of this Section) for each inspection. Record all deficiencies of site controls, and take appropriate action to correct any deficiencies recorded. Exception is rock berms located in a streambed. Any rock berm located in a streambed shall be inspected on a daily basis. Keep records of inspections current and on file, available for review by EPA, TCEQ, MS4 operator Representative and/or Owner’s Representative/s.

3.3.2 Contractor shall keep records of all Contractor inspections on file with SWPPP booklet at the Project Site, and make available for review by Owner’s Representative(s) or EPA, TCEQ or MS4 operator officials requesting review of SWPPP inspection records. One copy of each inspection report shall be delivered to the Owner’s Designated Representative.

3.3.3 Contractor shall keep records of all major grading and stabilization activities on file with the SWPPP booklet at the project site and make available for review by owner’s representative(s), EPA, TCEQ, or MS4 operator officials requesting review of the SWPPP.

3.3.4 Contractor shall submit copies of all inspection records and the Major Grading and Stabilization Log along with SWPPP booklet, to the Owner’s Designated Representative at project completion.

3.4 MAINTENANCE

3.4.1 All erosion and sediment control measures and other protective measures identified in the SWPPP must be maintained in effective operating condition. If through inspections the permittee determines that BMP’s are not operating effectively, maintenance must be performed before the next anticipated storm event or as necessary to maintain the continued effectiveness of storm water controls.

3.4.2 If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable. Erosion and sediment controls that have been intentionally disabled, run-over, removed or otherwise rendered ineffective must be replaced or corrected immediately upon discovery.

PART 4- SAMPLE FORMS

4.1 The Contractor shall use the following forms or sketches in the execution of the work in this Section, in compliance with TPDES requirements and the SWPPP. Contact the Owner’s representative for useable copies of the Owner-furnished forms:

- City of Houston forms (weblink -- http://cleanwaterways.org/downloads/)
- MD Anderson Cancer Center SWPPP Project Start-up Form
- MD Anderson Cancer Center SWPPP Inspection Form (Template)
- Major Grading and Stabilization Activities Log
• SWPPP Posting Sign for Main Construction Entrance for large construction site (5 acres or greater)
• SWPPP Posting Sign for Main Construction Entrance for small construction site (1 to less than 5 acres)

4.2 Retrieve the most current TCEQ forms directly from the TCEQ website:

http://www.tceq.state.tx.us/permitting/water_quality/stormwater/TXR15_5_plus_steps.html

• TCEQ TPDES Notice of Intent (NOI) (weblink - http://www.tceq.state.tx.us/assets/public/permitting/waterquality/forms/20022.pdf)

• TCEQ TPDES Large Construction Site Notice (weblink -- http://www.tceq.state.tx.us/assets/public/permitting/waterquality/attachments/stormwater/txr15largepri.pdf )


• TCEQ TPDES Notice of Termination (NOT) (weblink -- http://www.tceq.state.tx.us/assets/public/permitting/waterquality/forms/20023.pdf )

END OF SECTION 01 57 23
SWPPP Project Start-up

Contractors must meet four (4) TPDES requirements before soil-disturbing activities can commence on Owner construction projects. This form provides the Contractor and Owner an acceptance of compliance with initial BMP’s and required paperwork for commencement of work on the project site.

The Contractor is to initial items that are certified as complete and then review for concurrence with the Owner’s Designated Representative.

1. Best Management Practices (BMP’s) applicable to this project have been inspected to ensure correct placement in accordance with the SWPPP and for proper installation according to specifications.

   Initial by Contractor       Initial by Owner

2. The approved Storm Water Pollution Prevention Plan (SWPPP) is approved and on site.

   Initial by Contractor       Initial by Owner

3. The TCEQ NOI and Site Notice forms (and permits if received) or the TCEQ CSN’s are complete and posted for all permittees at the main entrance to the project site.

   Initial by Contractor       Initial by Owner

4. Inspector qualifications and letter of delegation of authority are inserted in the SWPPP.

   Initial by Contractor       Initial by Owner

Having met the above requirements and in recognition of prior receipt of Notice to Proceed, the Contractor is authorized to commence work on site.

CPM Project #______

Contractor

Date: ____________________

Owner’s Designated Representative
# SWPPP Inspection Report

<table>
<thead>
<tr>
<th>Inspection Issue</th>
<th>Y</th>
<th>N</th>
<th>N/A</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Are TPDES NOI’s, permits, or CSN’s for all permittees posted at the construction entrance?</td>
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<td>Is contact information for all permittees posted at the construction entrance?</td>
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<td>Are copies of inspection reports for all permittees included with the SWPPP?</td>
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<td>Is a copy of the NOI, TPDES Permit and Posting Notice or CSN for all permittees included with SWPPP?</td>
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<td>If the BMP’s have been modified, has the SWPPP been modified?</td>
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<td>Is the major grading and stabilization activities log current</td>
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<td>Are there any signs of discharge leaving the site?</td>
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<td>Are all BMP’s functioning as intended?</td>
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<td>Any additional BMP’s required?</td>
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<td>Are stabilized entrances/exits preventing street contamination?</td>
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<td>Are any BMP’s in need of repair and/or maintenance?</td>
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<td>Are any hazardous materials being exposed to storm water runoff?</td>
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<td>Have there been any reportable spills of hazardous materials?</td>
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<td>Have all areas of the site not covered by impervious materials achieved the</td>
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<td>required coverage?</td>
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<td>Are all soil-disturbing activities complete?</td>
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<td>Has a Notice of Termination (NOT) been filed?</td>
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**NOTE:** All items of non-compliance shall be repaired/installed within seven (7) calendar days of inspection. Repairs/installation shall be completed immediately, if storm conditions are imminent.

Note incidents of non-compliance: ____________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

“**I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.**”

Signature: ___________________________ Date: _______________

Printed Name: ___________________________

Title: ___________________________
## Storm Water Pollution Prevention Plan

### Major Grading and Stabilization Activities Log

<table>
<thead>
<tr>
<th>Start Date</th>
<th>End Date*</th>
<th>Type and Location of Activity</th>
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*End Date does not pertain to stabilization activities*
MINIMUM SIGN SPECIFICATIONS: 5 Acre or Greater Sites

SIGN: Exterior grade ¾ inch plywood, cut 4’ x 4’, with red painted letters, background painted white – DISPLAY ON CONSTRUCTION FENCE AT MAIN ENTRANCE TO PROJECT SITE.

SWPPP: 10 inch painted letters, 3 inches from top of sign, centered

CONTRACTOR OWNER: 3 inch painted letters, 4 inches below SWPPP letters, centered on each half of sign

NOI, PERMIT, CONTACT: 8-1/2 X 11 TCEQ forms, laminated beyond edges of documents, stapled to plywood.
SITE NOTICE

MINIMUM SIGN SPECIFICATIONS: 1 to Less Than 5 Acre Sites

SIGN: Exterior grade ¾ inch plywood, cut 4’ x 4’, with red painted letters, background painted white – DISPLAY ON CONSTRUCTION FENCE AT MAIN ENTRANCE TO PROJECT SITE.

SWPPP: 10 inch painted letters, 3 inches from top of sign, centered

CONTRACTOR  OWNER: 3 inch painted letters, 4 inches below SWPPP letters, centered on each half of sign

CONSTRUCTION SITE NOTICE: 8-1/2 X 11 TCEQ forms, laminated beyond edges of documents, stapled to plywood.
EXHIBIT “A”
Area Inlet Detail

AREA INLET PROTECTION

1. STEEL POSTS THAT SUPPORT THE SILT FENCE SHALL BE INSTALLED AT EACH CORNER AND IN BETWEEN CORNERS IF THE DISTANCE IS GREATER THAN 6’ BETWEEN CORNER POSTS.

2. USE SILT FENCE DETAIL FOR INSTALLATION OF THE SILT FENCE AROUND THE AREA INLET.

3. THE METAL AREA INLET GRATE SHALL BE LIFTED AND FILTER FABRIC WRAPPED AROUND THE GRATE AND THE GRATE SHALL BE REPLACED.

4. IN VEHICULAR TRAFFIC AREAS THE METAL GRATE SHALL BE LIFTED OUT AND WIRE FENCE MATERIAL SHALL BE PLACED UNDER IT WITH FILTER FABRIC PLACED BETWEEN THE GRATE AND THE WIRE FENCE. THE WIRE FENCE SHALL THEN BE ATTACHED TO THE GRATE.

5. ACCUMULATED SILT SHALL BE REMOVED WHEN THE FILTER FABRIC OVER THE GRATE COMPLETELY COVERS THE GRATE AREA, AND THE SILT AROUND THE SILT FENCE REACHES A HEIGHT OF 6”.

6. AREA INLET PROTECTION SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED.
EXHIBIT “B”
Curb Inlet Detail

EXTEND 2’ – 0” MINIMUM BEYOND INLET OPENING AT EACH END

VARIIES
3” OVERLAP AT FABRIC SPLICES

NON-WOVEN GEOTEXTILE FABRIC

2” X 4” WIRE FABRIC STRUCTURE

FLOW

12”

FLOW

CUT AWAY OF FILTER FABRIC

1” x 4” LUMBER SECURED TO CONCRETE

2-1/2” CLEAR OPENING

1” x 4” LUMBER SECURED TO CONCRETE

(PAY CAREFUL ATTENTION TO THIS AREA
(WILL ALLOW POLLUTANTS TO ENTER IF NOT SECURED)

Curb Inlet Protection

1. WHERE MINIMUM CLEARANCES CAUSE TRAFFIC TO DRIVE IN THE GUTTER,
USE 1” X 4” LUMBER SECURED WITH CONCRETE NAILS 3’ O.C. NAILED INTO
THE CONCRETE. IF PEDESTRIAN TRAFFIC ONLY THE USE OF 20# GRAVEL
BAGS TO SECURE MATERIAL IS PERMITTED.

2. AS SECTION OF FILTER FABRIC SHALL BE REMOVED AS SHOWN IN THIS
DETAIL. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR HOG
RINGS AT THIS LOCATION.

3. DAILY INSPECTION SHALL BE MADE AND SILT ACCUMULATION MUST BE
REMOVED WHEN DEPTH REACHES 2”.

4. THE PERFORMANCE OF THE INLET PROTECTION SHALL BE MONITORED
DURING EACH RAINFALL EVENT AND PROTECTION SHALL BE IMMEDIATELY
REMOVED IF THE STORMWATER BEGINS TO OVERTOP THE CURB.

5. INLET PROTECTION SHALL BE REMOVED AS SOON AS THE SOURCE OF
SEDIMENT IS STABILIZED.
EXHIBIT “C”
Rock Berm Detail

ROCK BERM

1. USE ONLY OPEN GRADED ROCK (4” X 8”) FOR STREAM FLOW CONDITIONS. USE OPEN GRADED ROCK (3” X 5”) FOR OTHER CONDITIONS.

2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING A MAXIMUM 1” OPENING AND A MINIMUM WIRE DIAMETER OF 20 GA. ROCK BERMS IN CHANNEL APPLICATIONS SHALL BE ANCHORED FIRMLY INTO THE SUBSTRATE A MINIMUM OF 6” WITH TEE POSTS OR WITH #5 OR #6 REBAR, WITH A MAXIMUM SPACING OF 48” ON CENTER.

3. THE ROCK BERM SHALL BE INSPECTED WEEKLY AND THE STONE AND/OR FABRIC CORE-WOVEN SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED; DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC, ETC.

4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR 6” WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF ON AN APPROVED SITE AND IN A MANNER THAT WILL NOT CREATE A SILTRATION PROBLEM.

5. DAILY INSPECTION SHALL BE MADE ON SEVERE-SERVICE ROCK BERMS; SILT SHALL BE REMOVED WHEN ACCUMULATION REACHES 6”

6. WHEN THE SITE IS COMPLETELY STABILIZED, THE ROCK BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.
EXHIBIT “D”
Silt Fence Detail

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POSTS MUST BE EMBEDDED A MINIMUM OF 12".

2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF THE FLOW. WHERE FENCE CAN NOT BE TRENCHED INTO THE SURFACE (E. G. PAVEMENT) THE FABRIC SHALL BE WEIGHTED DOWN WITH ROCK OR 1" X 4" LUMBER SECURELY FASTENED TO THE SURFACE, ON THE UPSTREAM SIDE TO PREVENT FLOW UNDER THE FENCE.

3. THE TRENCH MUST BE A MINIMUM OF 6" DEEP AND 6" WIDE TO ALLOW FOR THE FILTER FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.

4. THE FILTER FABRIC SHALL BE SECURELY FASTENED TO THE WOVEN WIRE BACKING, WHICH IN TURN IS SECURELY FASTENED TO THE STEEL FENCE POST.

5. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6", THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SITRICATION.

6. INSPECTION SHALL BE MADE WEEKLY AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY, IF NEEDED.

7. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED.
EXHIBIT “E”
Triangular Dike Detail

**Installation Options:**
1. **Toe-in 6” Minimum**
2. **Weighted with 3”x5” Open Graded Rock**
3. **Trenched in 4”**
4. **Continuous Backing/Planks on Impervious Surface**

**Non-Woven Geotextile Fabric**
Note: Filter fabric shall cover dike and skirt entirely

**6”x6” Wire Mesh Structure**

**Flow**

**Fabric Toe-in**

**Open Graded Rock**

**Trenched**

**18”**

**12”**

**6”x 1-1/2” Anchors every 2’**

**TRI DIKE FILTER DAM**

1. DIKES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT DIKE.
2. THE FABRIC COVER AND SKIRT SHALL BE A CONTINUOUS WRAPPING OF NON-WOVEN GEOTEXTILE. THE SKIRT SHALL BE A CONTINUOUS EXTENSION OF THE FABRIC ON THE UPSTREAM FACE.
3. THE SKIRT SHALL BE WEIGHTED WITH A CONTINUOUS LAYER OF 3” X 5” OPEN GRADED ROCK, 1” X 4” LUMBER (SECURELY FASTENED), OR TOED IN 6” WITH MECHANICALLY COMPACTED MATERIAL. OTHERWISE, SHALL BE TRENCHED IN 4” IN DEPTH.
4. DIKES AND SKIRT SHALL BE SECURELY ANCHORED IN PLACE USING 6” WIRE STAPLES ON 2’ CENTERS ON BOTH EDGES OF SKIRT, OR STAKE USING 3/8” REBAR WITH TEE ENDS.
5. FILTER MATERIAL SHALL BE LAPPED OVER ENDS 6” TO COVER DIKE TO DIKE JOINTS. JOINTS SHALL BE FASTEN WITH GALVANIZED SHOAT RINGS.
6. THE DIKE STRUCTURE SHALL BE 6 GA. 6”X 6” WIRE MESH, 18” ON A SIDE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6” AND DISPOSED OF IN A MANNER WHICH WILL NOT CAUSE ADDITIONAL SFLTRATION.
8. INSPECTION SHALL BE MADE WEEKLY AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
9. AFTER THE SITE IS COMPLETELY STABILIZED, THE DIKES AND ANY REMAINING SILT SHALL BE REMOVED.
A steel grid that allows the safe passage of vehicles while agitating the tires to loosen and remove the soil build up. The grid or structures shall conform to the following:

1. IT SHALL CONSIST OF PIPES OR TUBES SPACED SUCH THAT THERE IS A MINIMUM CLEAR DISTANCE BETWEEN THE PIPES OR TUBES OF 4 ½”. IT SHALL BE ELEVATED ABOVE THE GROUND SURFACE A MINIMUM OF 8” TO ALLOW WATER, DEBRIS AND SOIL TO DRAIN.
2. MINIMUM DIAMETER OF PIPE OR TUBE SHALL BE 3”.
3. IT SHALL BE DESIGNED TO SUPPORT ANY AND ALL VEHICLES ENTERING AND LEAVING THE CONSTRUCTION SITE.
4. IT SHALL BE FIRMLY PLACED IN THE GROUND AT THE EXIT.
5. IT SHALL BE OF SUFFICIENT LENGTH SO THAT THE AGITATION WILL REMOVE THE SOIL FROM THE TIRES OR A MINIMUM OF 8'-0”.
6. AT THE “STREET SIDE” APPROACH OF THE GRID THERE SHALL BE AN IMPERVIOUS SURFACE OR IT SHALL CONSIST OF 3” TO 5” DIAMETER ANGULAR CRUSHED STONE/ROCK APPROXIMATELY 5’-0” IN LENGTH, MINIMUM, AND 8” DEEP, MINIMUM. ON THE “JOB SITE” SIDE OF THE GRID, THERE SHALL BE 3” TO 5” DIAMETER ANGULAR CRUSHED STONE/ROCK 15’-0” IN LENGTH, MINIMUM, 8” DEEP, MINIMUM. THE STEEL GRID WILL BE BETWEEN THE “STREET SIDE” APPROACH AND THE JOB SITE CRUSHED STONE/ROCK. ALL CRUSHED STONE/ROCK SHALL HAVE FILTER FABRIC BENEATH THE STONE/ROCK.
7. STEEL GRID AREA SHALL BE USED AS THE TIRE WASH AREA. WHEN TIRE WASH IS IN USE (RAINY OR MUDDY DAYS) THE AREA SHALL BE MANNED AND THE TIRES SHALL BE WASHED USING A HIGH PRESSURE HOSE/NOZZLE.
8. THE AREA BENEATH THE GRID SHALL BE SLOPED SUCH THAT DEBRIS, SOIL AND WATER SHALL BE DIVERTED BACK ON TO THE CONSTRUCTION SITE OR TO A SEDIMENT BASIN. NO WATER, SOIL OR DEBRIS SHALL LEAVE THE CONSTRUCTION SITE. THE RESULTING DISCHARGE SHALL BE DISPOSED OF PROPERLY.
EXHIBIT “G”
Concrete truck washout

1. The excavation for the concrete truck washout shall be a minimum of 10’ wide and of sufficient length and depth to accommodate 7 gallons of washout water and concrete per truck per day and/or 50 gallons of washout water and concrete per pump truck per day.
2. In the event that the self-installed concrete truck washout is constructed above ground, it shall be 10’ wide and 10’ long with the same requirements for containment as described in item 1.
3. The containment area shall be lined with 10 mil plastic sheeting, without holes or tears. Where there are seams, these shall be secured according to manufacturers directions.
4. The plastic sheeting shall be of sufficient size so that it will overlap the top of the containment area and be wrapped around the gravel bags, concrete blocks or open graded rock at least 2 times.
5. The gravel bags or concrete blocks shall be placed abutting each other to form a continuous berm around the outer perimeter of the containment area.
6. The berm consisting of gravel bags, concrete blocks or open graded rock shall be no less than 18” high and no less than 12” wide.
7. The containment area shall not exceed 50% of capacity at any one time.
8. Solids shall be removed from containment area and disposed of properly and any damage to the plastic sheeting shall be repaired or sheeting replaced before next use.