Storm Water Quality Management for Urban Roadways

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Harris County Engineering Department
Agenda

1. Introduction
2. Project Development
3. Construction Phase
4. Post Construction
5. Questions
Mission

The mission of the Harris County Engineering Department is to execute the planning, study, property acquisition, design and construction of various buildings, roads, bridges, traffic signals, drainage improvements, parks, and other architectural and maintenance projects...

We create innovative customer driven solutions for all projects.
Typical County Roadway Expansion
Study Phase - Environmental Studies

- Phase I & II Environmental Site Assessments (ESA)
- Waters of the U.S. / Wetlands
- Threatened and Endangered Species
- Cultural / Archeological Resources
- USACE Permits
Study Phase – Other Studies

- Alignment
- Right of Way
- Utilities
- Geotechnical
- Traffic
- Drainage/Hydrology
Design Phase

- Develop Storm Water Pollution Prevention Plans
- Design Storm Water Quality Management Plans
- Select BMPs, Specifications, & bid/pay items.
- Obtain plan approvals & permits.
STORM WATER POLLUTION PREVENTION PLAN

MAJOR SOIL DISTURBING ACTIVITIES:

ACTIVITY (CHECK ALL THAT APPLY)

SPEC 102 – Clearing & Grubbing

SPEC 104/110/400 – Exca

SPEC 400 – FBA

NOTES:

See Site Plan for detailed planning drawings.

SOIL STABILIZATION AND SEDIMENT CONTROL MEASURE:

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<th>MEASURES</th>
<th>TEMPORARY</th>
<th>PERMANENT</th>
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<tr>
<td>SPEC 164 – Seeding</td>
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<td>SPEC 162 – Sodding</td>
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<td>SPEC 180 – Hydro-mulch</td>
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<td>SPEC 164 – Soil Retention Blanket</td>
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<td>SPEC 313 – Reinforced Filter Fabric Barrier</td>
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<td>SPEC 719 – Inlet Protection Barrier</td>
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<td>SPEC 724 – Stabilized Construction Access</td>
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<td>SPEC 730 – Concrete Truck Washout Structures</td>
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<td>SPEC 741 – Inlet Protection Barrier</td>
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<td>SPEC 750 – Rock Filter Dam</td>
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<td>SPEC 785 – Watering for Dust Control</td>
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Notes: If sediment escapes off site, these accumulations will be removed to minimize impact. Rock filter dams will be cleared before the project, 1/3 the height of the dam, other control measures will be cleared before their efficiency has been reduced by 50%. As required in DEP TNR 15000D, soil stabilization measures will be initiated in portions of the site where activities have occurred for a period exceeding 14 days. This stabilization will commence no later than the date indicated completion of work in these areas. If spillage or recontamination is not feasible, the reason will be documented in the SWPPP. Records of dates for major grading activities, and initiation of stabilization measures will be maintained in the SWPPP. Daily work logs related to this section will be kept in CAPTRAC. The Harris County SWPPP detail sheet will be used when implementing BMP’s not included in this document.

DESCRIPTION OF DRAINAGE AREAS AND OUTFALLS:

All outfall structures will be constructed in accordance with Harris County Specification 441, and any applicable specification referenced by it. Drainage pathways will drain to storm water system with other attachments to SWPPP.

RECEIVING WATERS/CONVEYANCE:

RCE 303(c) listed water X

DESIGN PHASE

PROJECT NAME:

LOCATION & LIMITS:

See plan cover sheet for vicinity map.

PROJECT SCOPE:

- Roadway Expansion
- Roadway New Construction
- Underground Storm Sewer
- Detention Pond
- Bridge Expansion
- Bridge New Construction

TOTAL PROJECT AREA: __________ Acres __________________________ Linear Feet

TOTAL AREA DISTURBED: __________ Acres

EXISTING CONDITIONS OF SOIL, VEGETATION, AND DRAINAGE:

PHASED CONSTRUCTION ACTIVITIES:

DESCRIPTION OF DRAINAGE AREAS AND OUTFALLS:

RECEIVING WATERS/CONVEYANCE:

DO NOT SEAL

HARRIS COUNTY ENGINEERING DEPARTMENT

SIGNATURE

PROJECT NO.

DATE: 3/24/16 SWPPP Sheet 1

SHEET DESCRIPTION:

SHEET NO: 1

CURRENT CONSTRUCTION SPECIFICATION DOCUMENTS CAN BE FOUND AT:
http://www.epa.hcva.net/consultants/standards-s specifications/standard-design-engineering-specifications

INSPECTION & MAINTENANCE:

Inspection and maintenance will be performed according to SPEC 751. Inspections will be conducted at least every 7 calendar days. Inspections forms will be filled with SWPPP supporting documents. If needed or replacement of stabilization or erosion control features is required, it must be completed at the earliest date possible. Amendments will be included in the SWPPP Amendment Log. Daily work logs related to this section will be kept in CAPTRAC.

POTENTIAL POLLUTION SOURCES:

Concrete X

Cleaning Solvents X

Fertilizer X

Cutting Compounds X

Pesticides X

Hydraulic Fluid X

Asphalt X

Motor Oil X

Paint X

Gas X

Diesel Fuel X

Sanitary Disposal X

POLLUTION PREVENTION BMPS:

Whenever possible all materials will be stored in their original containers in secure areas where spills are protected from runoff. Storages and work areas will be constructed in such a way to minimize the amount of sediment that enters receiving waters and wetlands. Soil erosion and control measures are included in the SWPPP design. Records of spills will be maintained with SWPPP supporting documents. Additional required BMPs can be found in SPEC 751. Temporary materials and structures will be removed from work areas as soon as feasible once they are no longer required.

WASTE MATERIAL:

All solid waste materials will be collected and stored in secure metal dumpsters, then transported to proper disposal facilities. Collection will be completed often enough to ensure that no waste materials will be left due to overflowing collection containers. Liquid waste will be stored in sealed containers in designated areas and disposed of according to all applicable regulations. All waste containers should meet all state and local requirements.

RESPONSIBLE PARTY/CONTRACTOR

Name:

Title:

Company:

Signature:

HARRIS COUNTY

ENGINEERING DEPARTMENT

DATE: 3/24/16 SWPPP Sheet 1

DO NOT SEAL
Construction Phase BMPs

- TCEQ Construction General Permit
- County/City Stormwater Regulations
- Implement SWPPP & BMPs

Agencies:
Post-Construction BMPs

- New Development greater than 5 acres
- Significant Redevelopment greater than 1 acre
- Also applies to roadways.
- Various methods used since about 2002.
The “First Flush” Dry Basin
Dry/Wet outlet designs
Floatables Collection Screen
Wet Bottom Detention
Urban Forestry
ACCEPTABLE URBAN FORESTRY CRITERIA

TREES SHALL BE A MINIMUM OF 1.5 CALIFER (DIAMETER) AT THE BASE AND 4 FEET TALL WHEN PLANTED AND A MAXIMUM OF 3 INCHES IN CALIFER AND 14 FEET HIGH. AMERICAN STANDARDS FOR NURSERY TREE SPECIES MAY BE USED AS WELL.

IF ESSENTIAL THAT TREES BE SELF-SUPPORTING WITH STRAIGHT TRUNKS AND LEAVES OR TOPS INTACT, TREES THAT HAVE BEEN SHAPED OR TRAINED SHOULD BE NORMALLY SHAPED FOR THEIR SPECIES AND WELL BRANCHED WITH FULLAGE WHEN LEAFED OUT. THE STUBS MUST BE HEALTHY AND SUPPLELY WATERED TO ALLOW RECOVERY AFTER PLANTING. THE TRUNK MUST BE FREE OF BRANCHES AND OTHER OBSTRUCTIONS AND THE TREE FREE OF INSECTS AND DISEASE.

PLANTING TIME

THE RECOMMENDED TREE PLANTING TIME IN THE HARRIS COUNTY AREA IS USUALLY EARLY FALL UNTIL LATE FALL. MULTIPLE. May well be early fall to winter. PLANT TREES IN LATE FALL OR WINTER ALLOW ROOTS TO BE ESTABLISHED BEFORE WINTER. MORNING TAKES PLACE ON A MINIMUM OF 2 YEARS.

SPACING REQUIREMENTS

TREES SHALL BE PLANTED AT 6 CALIFER INCHES PER 100 LINEAR FEET OF NEW SINGLE LANE PAVEMENT FOR ROAD PROJECTS AND A MINIMUM OF 1 CALIFER INCH PER 70 SQUARE FEET OF IMPERVIOUS SURFACE FOR ALL OTHER DEVELOPMENT PROJECTS.

LONG-TERM SURVIVAL: THERAPY IS THE PRIMARY URBAN FORESTRY PLANTING THUS ALL PLANTING IS ONE LINEAR FEET OR SIMILAR APPLICATIONS IS OF AT LEAST 4 (FOUR) DIFFERENT SPECIES FROM THE RECOMMENDED TREE LIST.

THE FOLLOWING SPECIES REQUIREMENTS ARE PARTICULARLY APPLICABLE TO THE STREET PLANTING IN HARRIS COUNTY:

- NO TREES THAT WILL HAVE A MAURICE TREE TRUNK DIAMETER GREATER THAN 12 INCHES AT THE BASE SHOULD BE PLANTED IN A TRAFFIC LANE OR RIGHT-OF-WAY LESS THAN 3 FEET WIDE.
- TREES SHOULD NOT BE PLANTED WITHIN 30 FEET OF AN INTERSECTION OR WHERE THEY BLOCK VIEWS FOR SAFETY.
- TREES SHOULD NOT BE PLANTED WITHIN 10 FEET OF UTILITY POLES OR WITHIN 15 FEET OF DRIVEWAYS AND ALLIES.
- TREES SHOULD BE PLANTED AT FRONT LINES, THOSE THAT MATURE TO A HEIGHT GREATER THAN 30 FEET, SHOULD BE PLANTED 25 TO 60 FEET APART.
- SMALL TREES, THOSE THAT MATURE TO LESS THAN 30 FEET IN HEIGHT, SHOULD BE PLANTED A MINIMUM OF 100 FEET APART.
- IN BUSINESS DISTRICTS AND GENERAL PARKING AREAS, TREES MUST BE PLANTED A MINIMUM OF 30 FEET FROM THE CURB TO PREVENT DAMAGE FROM OR TO BUMPERS AND SIDES.
- ONLY TREES WITH A MAURICE HEIGHT OF LESS THAN 25 FEET SHOULD BE PLANTED UNDER UTILITY LINES.

URBAN FORESTRY CALCULATIONS

CHECK APPROPRIATE BOX, CALCULATE REQUIRED CALIFER INCHES AND COMPLETE TREE PLANTING SCHEDULE:

- New Pavement: CALIFER INCHES REQUIRED
- In New Improvements or Other Pavement: CALIFER INCHES REQUIRED
- SLA = SINGLE LANE PAVEMENT LENGTH MEASURED IN FEET
- SFA = SQUARE FOOT AREA OF IMPERVIOUS SURFACE

SWQ IMPACT EVALUATION

1. THIS PROJECT DECREASES THE AMOUNT OF WATER DRAINED OFF THE SITE.
2. THIS PROJECT INCREASES THE WATER DRAINED OFF THE SITE.
3. THIS PROJECT DECREASES THE WATER DRAINED OFF THE SITE.
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PLANTING SCHEDULE

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<th>TREE NUMBER</th>
<th>SPECIES</th>
<th>CALIFER INCHES</th>
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HARRIS COUNTY PUBLIC INFRASTRUCTURE DEPARTMENT ENGINEERING DIVISION VERSION 1.0
Low Impact Development

Low Impact Development (LID) is a comprehensive land planning and engineering design approach with the goal of maintaining, as the minimum, the pre-development hydrologic regime in a watershed without solely using conventional development and detention basin techniques to satisfy drainage and flood mitigation requirements.

Typical Detention Systems

Birnamwood Dr. - Bioswale
LID Design provided a cost effective, sustainable roadway leading to an anchor park along spring creek.
LID - Louetta
Harvey-Roadway Impacts

Public Infrastructure
Roadway Damages:

- 45 Bridges
- 54 Roadways
- 58 Traffic Signals
Summary

- Harris County has been implementing post construction stormwater BMPs since about 2002.

- Various ways to treat stormwater within a roadway project.

- Available storage space and offsite drainage are significant challenges.
Questions

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