SATISFYING VOLUME CONTROL REQUIREMENTS FOR RYAN FIELD WEST PARKING LOT RECONSTRUCTION

IAFSM 2017 CONFERENCE

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PRESENTED BY:

GEWALT HAMILTON ASSOCIATES, INC.
PRESENTATION OVERVIEW

• MWRD VOLUME CONTROL REQUIREMENTS
• EXAMPLES OF VOLUME CONTROL FACILITIES
• RYAN FIELD CASE STUDY
WMO VOLUME CONTROL REQUIREMENTS

“503.2: THE FIRST INCH OF RUNOFF FROM THE IMPERVIOUS AREA OF DEVELOPMENT ON THE SITE SHALL BE THE VOLUME CONTROL STORAGE”

• PERMEABLE PAVEMENT, SYNTHETIC FIELD, RUBBERIZED SURFACE PLAYFIELD, AND OTHER POROUS SURFACES NOT CONSIDERED IMPERVIOUS

• UNDERDRAINS ARE REQUIRED IF INFILTRATION RATE < 0.5 IN/HR

• PRETREATMENT REQUIREMENTS

• IMPERVIOUS AREAS TRIBUTARY TO VOLUME CONTROL FACILITY

• SITE CONSTRAINTS REVIEWED BY MWRD ON A CASE BY CASE BASIS

• OBSERVATION WELL

• THE TGM IS A VERY GOOD RESOURCE
VOLUME CONTROL FACILITIES

- Stone voids under pavement (permeable or traditional)
- Dry wells
- Bio-retention system
- Water reuse systems
- Green roofs
- Bioswale
- Constructed wetlands
- Infiltration trench
- Storage below detention basin outlet
- Underground vault space
- Vegetated filter strip (flow-through)
- Perforated pipes (including arch-pipe chambers)
DEEP ROOTED NATIVE PLANTS, INSTALLED AS SPECIFIED ON PLANS. USE VEGETATION TOLERANT OF WET AND DRY CYCLES.

OBSERVATION WELL, 6" PVC PIPE WITH OVERFLOW GRATE, NON PERFORATED ABOVE SOIL MEDIA MIX 6" - 12" ABOVE GROUND.

SHREDDED HARDWOOD MULCH LAYER (3") (SEE NOTE 8)

20% MAX. SLOPE

VEGETATED FILTER STRIP/OTHER BMPS (SEE NOTE 9)

12" DEPTH MAXIMUM DRAINS IN 24-48 HOURS

20% MAX. SLOPE

18" SOIL MEDIA MIX, 50% SAND 30% COMPOST 20% TOPSOIL (OR DISTRICT MIX)

WOVEN GEOTEXTILE FABRIC, NOT TO COVER ENTIRE BOTTOM OF EXCAVATION (OR CHOKING STONE PER ENGINEER APPROVAL)

VEGETATED FILTER STRIP/OTHER BMPS (SEE NOTE 9)

2.5 OFFSET

18" V OCCUPIED BY NATIVE SOIL 10" MIN.

CA-7 COARSE AGGREGATE STORAGE BED WITH 4" UNDERDRAIN PERFORATED PIPE (SEE NOTE 6)

2" TO 12" STONE BEDDING (SEE NOTE 7)

SEASONALLY HIGH GROUNDWATER LEVEL (______ NAVD 88)
SEASONALLY HIGH GROUNDWATER TABLE

- Bottom of storage must be above seasonally high groundwater level
  - At least 2’ separation when V.C. facility is tributary to waterway
  - At least 3.5’ separation when V.C. facility is tributary to combined sewer
- Seasonally high groundwater level established through soil borings
  - Ensure soil borings are deep enough for your project
  - Discuss with the geotechnical engineer prior to the storm water design to avoid delays during design
- Infiltration test
  - K value can be estimated during preliminary design for underdrain applicability
- Perched water table
EXISTING CONDITIONS

• LOCATED WEST OF RYAN FIELD
• POORLY DRAINED SILTY CLAY SOIL
• SEASONALLY HIGH GROUNDWATER LEVEL AT 6’ BELOW EXISTING GROUND
• NO EXISTING DRAINAGE
• LOCATED IN COMBINED SEWER AREA
• TRIBUTARY TO WATERWAY
RYAN FIELD WEST PARKING LOT IMPROVEMENTS

PROPOSED IMPROVEMENTS

• PARKING LOT RECONSTRUCTION
• PERMEABLE PAVEMENT AT NORTH END PERIMETER
• RAIN GARDENS WITHIN ISLANDS
• TWO STORMTRAP UNDERGROUND DETENTION/VOLUME CONTROL VAULTS
• PRETREATMENT: SNOUTS INSTALLED IN CATCH BASINS UPSTREAM OF VAULTS
• CITY OF EVANSTON DETENTION
• MWRD DETENTION & VOLUME CONTROL
RYAN FIELD WEST PARKING LOT IMPROVEMENTS:

UNDERGROUND VAULTS
RYAN FIELD WEST PARKING LOT IMPROVEMENTS:
RAIN GARDENS
RYAN FIELD WEST PARKING LOT IMPROVEMENTS:

PERMEABLE PAVEMENT
RYAN FIELD WEST PARKING LOT IMPROVEMENTS:

CHALLENGES

• VOLUME CONTROL STRUCTURAL ISSUES
  • SEASONALLY HIGH GROUNDWATER LEVEL ENCOUNTERED AT 6’ BELOW GROUND
    • SHALLOW UNDERGROUND VAULT
  • WORKED WITH MANUFACTURER
  • AVOIDED CONCRETE FOOTINGS

• NO PARKING LOT SURFACE STORAGE

• DRAINING IMPERVIOUS AREAS TO VC FACILITIES
RYAN FIELD WEST PARKING LOT IMPROVEMENTS:
COMPLETION OF PROJECT IN TIMELY MANNER

• OBTAINING WMO PERMIT
  • COMMUNICATED WITH MWRD DURING DESIGN AND PERMIT REVIEW PERIOD
  • INCORPORATED A VARIETY OF GREEN INFRASTRUCTURES WITH “GOOD FAITH EFFORT”

• CONSTRUCTION COMPLETED IN 12 WEEKS, IN TIME FOR 2016 FOOTBALL SEASON
QUESTIONS?

CONTACT INFORMATION

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