TOWN OF WINDSOR

Town of Windsor
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MEMORANDUM

DATE: June 7, 2023

TO: All Concerned Parties

FROM: Shannon Cotulla, Public Works Director/Town Engineer

RE: Hydraulic Analysis Report Template for Development Projects within the Town of Windsor.

The purpose of this memo is to provide a template for items that are required to be incorporated into Hydraulic Analysis Reports for projects within the Town of Windsor. Additional items may be required at the discretion of the Town Engineer.

The Drainage Report submittal shall include at a minimum the following:

I. COVER SHEET

A. Name of Project
B. Address
C. Engineer
D. Submittal date and revision dates as applicable.

II. GENERAL LOCATION AND DESCRIPTION

A. Site Location
   1. Site Vicinity Map

      - Existing and proposed streets, roadways, and highways adjacent to and within the proposed development, or within the area served by the proposed drainage improvements.

B. Description of Property
   1. Area in Acres
   2. Ground cover, vegetation, site topography and slopes
   3. NRCS Soils Classification Map and discussion
   4. Major and minor drainageways
   5. Floodplains delineated on FEMA FIRM Maps (if applicable)
   6. Proposed land use.

III. DRAINAGE BASINS AND SUB-BASINS

A. Major and Minor Drainage Basins
   1. On-site and off-site major drainage basin characteristics and flow patterns and paths
   2. Existing and proposed land uses within the basins if known.
   3. Discussion of all drainageway planning or floodplain delineation studies that affect the major drainageways.
   4. Discussion of the condition of any channel within or adjacent to the development, including existing conditions, need for improvements, and impact on the proposed development.
   5. Discussion of the impacts of the off-site flow patterns and paths, under fully developed conditions.

IV. DRAINAGE DESIGN CRITERIA

A. Regulations
   1. *Sonoma Water Flood Management Design Manual* criteria

B. Drainage Studies, Outfall Systems Plans, Site Constraints
   1. Discuss previous drainage studies or master plans for the site or project that influence the stormwater facility design.
   2. Discuss impacts to stormwater management facility design caused by site constraints, such as streets, utilities, existing structures, etc.

C. Hydrology
   1. Runoff calculations method(s)
   2. Design storm recurrence intervals
   3. Design rainfall
   4. Detention storage calculation method(s)
   5. Detention storage release rate calculation method.

D. Hydraulics
   1. Methods used to determine conveyance facility capacities.
   2. Hydraulic grade line calculation method and discussion of loss coefficients.
   3. Methods used to calculate water surface profile.
   4. Detention pond routing.

V. STORMWATER MANAGEMENT FACILITY DESIGN

A. Stormwater Conveyance Facilities
   1. Discuss proposed drainage paths and patterns.
   2. Discuss storm sewer design, including inlet and pipe locations and sizes, tributary basins and areas, peak flow rates at design points, hydraulic grade lines, etc.
   3. Discuss storm sewer outfall locations and design, including method of energy dissipation.

4. Discuss how runoff is conveyed from all outfalls to the nearest major drainageway, including a discussion of the flow path and capacity downstream of the outfall to the nearest major drainageway.
5. Discuss open channel and swale designs, including dimensions, alignments, tributary basins and areas, peak flow rates at design points, stabilization and grade control improvements, low flow or trickle channel capacities, water surface elevations, etc.
6. Discuss overland release routes.

B. Stormwater Storage Facilities
   1. Discuss detention pond designs, including release rates, storage volumes and water surface elevations for the 2-year, 100-year and emergency overflow conditions, outlet structure design, emergency spillway design, etc.
   2. Discuss pond outfall locations and design, including method of energy dissipation.

   Discuss how runoff is conveyed from all pond outfalls and emergency spillways to the nearest major drainageway or stormdrain system.

C. Additional Permitting Requirements
   1. Section 404 of the Clean Water Act
   2. The Endangered Species Act
   3. Other local, state, or federal requirement.

D. General
   1. Discuss all tables, figures, charts, drawings, etc. that were used in design of stormwater management facilities and describe materials that are included in the appendix of the report.

VI. REFERENCES

Reference all criteria, master plans, reports or other technical information used in development of the concepts discussed in the drainage report.

VII. APPENDICES

A. Hydrologic Computations
   1. Determination of runoff coefficients and times of concentration.
   2. Peak flow rate calculations for the minor and major storms.
   3. Rainfall information.
   4. Hydrograph data (if applicable).
   5. Connectivity diagram showing relationship/connectivity of basins, conveyance facilities, detention ponds, and design points.

B. Hydraulic Computations

1. Culvert capacitiesStorm sewer capacities and hydraulic grade lines, including the loss coefficients.
2. Inlet capacities.
3. Open channel or swale capacities.
4. Stabilization and grade control improvements.
5. Water surface profiles.
6. Stage-storage-discharge determination for detention ponds.
7. Detention pond routing calculations.

C. Referenced Information

1. Copies of pertinent portions of all referenced materials or drainage reports.