

## External Engineering Site Plan Review Checklist

The following checklist covers commonly missed design elements. This is not a comprehensive list of requirements. There may be other correction comments outside of these items.

- All comments from MPR's have been addressed, and a written response has been provided to all conditions of approval from Special Use Permits (LU's), and Tentative Maps have been addressed.
- For Correction or Revision, is the PDF plan set a **full** plan set? Submitting only the corrected sheets is not acceptable.
- For Corrections, a response to all corrections has been provided.
- Plan and Profile Sheets. Plan and profile sheets shall have the same horizontal scale wherever possible. Plan and profile sheets shall have a minimum scale of 1" = 5' vertical and 1" = 40' horizontal. A scale bar shall be included on each sheet.
- Where sites cannot fit on one sheet, a key is provided showing what area in the overall site the sheet is depicting.
- The cover sheet has a general area map, correct address, and correct APN.

### **Entitlements and Easements**

- All existing and proposed easements are shown.
- Existing infrastructure is shown accurately at project extents.
- The project does not require notification per the FAA prescreening tool, otherwise an approval letter from the CC Airport Manager is included in the submittal. The FAA prescreening tool can be found at <https://oeaaa.faa.gov/oeaaa/oe3a/main/#/noticePrescreen>

### **Drainage, Erosion Control, and Grading**

- The following NDEP permits must be obtained before the permit is issued.
  - Construction Stormwater Permit (1 acre or more disturbed)
  - Surface Area Disturbance Permit (5 acre or more disturbed)
  - Dust Control Permit (20 acre or more disturbed)
- Special construction requirements from any required Geotechnical Study are reflected in the applicable plans.

If the average slope of the site is greater than or equal to 15% before construction, are the following hillside development standards ([CCDS 7](#)) met:

- Engineering Report Requirements,  Drainage Requirements,  Grading Plan Requirements,
- Revegetation,  Topographic mapping,  Driveway and parking requirements,  Buildable area and open space requirements,  Roadway requirements, and  All other requirements listed in CCDS 7-Hillside Development.

The Drainage Study table of contents matches the table of contents for Conceptual Studies (5.1 of the Drainage Manual) or Technical Studies (6.1 of the Drainage Manual) depending on which is required (see Table 2 of the Drainage Manual).

If basin is acting as retention (instead of desired detention) are perctest results provided and do they show that the basin can drain in 48 hours.

Do basins have overflows that are protected from erosion and routed to appropriate location?

Calculations have been provided to show that the basin outlets are metered appropriately.

Access to public storm drain improvements for maintenance meets the minimum required easement size per CCDS 18.2, table 18.1, and private storm drain infrastructure is accessible for maintenance.

All storm drain improvements on private property labeled as “private”?

All culverts 18 inches or larger.

All storm drains 15 inches or larger.

For structures, does the ground next to buildings slope away from the foundation at a minimum slope of; Soil=5%, Pavement=1%?

Do swales have a minimum slope of 1%?

Are cut/fill slopes and swales protected from erosion?

Are slopes greater than 10% protect with rip rap or other means of erosion protection to slow the velocity?

If there is more than 50cuyd of grading or more than 1 acre disturbed, are the erosion control notes from CCDS 19.2.11.2.5 shown?

If there is more than 50cuyd of grading or more than 1 acre disturbed, is an erosion control plan present showing at a minimum:

- A rock construction entrance (minimum 100')
- A lined concrete washout pit with a sign.
- Silt fence, wattles, or other runoff protection.

Storm drain inlet protection.

If necessary, are flood elevation certs provided, and correct? Are flood vents and elevations shown correctly in the site plans and architectural sheets?

If necessary, are waterproofing certs provided, and correct? Are correct materials called out in the plan set (this may be in the architectural sheets)?

If the permitted work is a "substantial improvement" according to the flood damage prevention section of the municipal code, the existing structure must be improved to meet current flood damage prevention standards.

### **Sewer Main**

NDEP Approval is required for any sewer main extensions, Subdivisions or PUD's, and Projects with 5 or more units.

If the project is within 400' of a sewer main and the main does not already extend along all frontages, the sewer main must be extended per [CCMC 12.05.050](#). For industrial or commercial developments utilizing over four (4.0) sewer equivalent residential customer (SERC) values shall extend the sewer main a distance equal to the SERC value times one hundred feet (100').

If you are required to complete a Sewer Main Analysis (see [CCDS 15.3.2](#)), ensure that the following items are addressed within the Sewer Main Analysis using calculations and maps:

- Stamped by a Professional Engineer.
- Area of project
- Tributary areas outside project
- Adjacent areas
- Contours usually extending a minimum of three hundred (300) feet beyond the project or as needed to evaluate localized tributary areas
- Line layout, pipe size and slope
- Predicted average and peak flows at major junction points including flow coming from outside the project area
- Direction of flow
- Zoning used to predict flows
- Special areas such as hospitals, schools, large office, or industrial buildings, etc.
- Boundaries of areas within the project which are tributary to points of major flow
- Floodplains. Is the sewer main in a floodplain?
- Scale
- Predicted flow from each area
- Peaking factors. Is the flow generation and peaking factors per recommended standards for wastewater facilities (ten (10) state standards)?

Cumulative flow. Does the sewer main meet the design velocity requirements of a minimum of 2 fps to a maximum of 10 fps? Mannings formula is to be used to determine the slope, velocity, design flow, and diameter.

Pipe capacities and depths of flow. The sewer mains are deemed to be at capacity when the design peak flow is at depth/diameter ( $d/D$ ) = 0.50, for a pipe that is 15 inches or less in diameter, and depth/diameter ( $d/D$ ) = 0.75, for a pipe that is greater than fifteen (15) inches in diameter? Has the sewer main been correctly sized to ensure it will not be at capacity?

Sewer mains meet Minimum Slope.

Dead-end mains = 0.5% or 2 fps

8-inch= 0.4% (minimum slope for 8-inch PVC SDR-35 flexible pipe)

10-inch= 0.25%

12-inch= 0.19%

15-inch= 0.14%

Sewer mains are no deeper than 8-feet. Deeper mains need special approval from the City Engineer.

Does the sewer main layout meet Carson City Standard detail C-1.2.4 Typical Utility Main Locations?

Any sewer main less than 24-inches is required to be straight between manholes and parallel with the street or easement centerline whenever possible. Does the proposed sewer line meet this requirement?

Horizontal curvature may be considered for sewer mains 24-inches or larger with special approval.

Vertical curvature of any sewer main is not allowed

All sewer mains must be at least 10-feet from any trees.

Does the public sewer meet minimum NAC separation requirements?

If not, ensure the areas that special construction is required is shown and called out on the plans.

Requirements to increase the size of a sewer main is as follows:

The invert of the larger sewer pipe shall be lowered to maintain the same energy gradient as the smaller pipe by placing the crown at the same elevation for both of the pipes.

The average energy gradient shall be obtained from the anticipated full flow capacities of the pipe.

Cover over main. The minimum depth of cover is 4-feet while the typical depth of cover is 6-feet.

Manholes are to be placed at the end of all sewer mains, at all intersections or mains, and at any changes of grade, size, or alignment.

If a sewer main is to be extended in the future, then a 1-foot stub shall be provided at the manhole.

If the existing stub is not available when extend a sewer main then the existing manhole base shall be removed and replaced.

- The maximum spacing between manholes is based on the diameter of the sewer main is as follows:
  - Smaller than 15-inches= 400 feet
  - Between 12-inches and 24-inches= 500 feet
  - 24-inches or larger = 600 feet
  
- If the proposed project is a commercial or industrial project then please provide the average gallons per day for the project and the applicable calculations used to find that number.

### **Water Main**

- NDEP Review for extensions to the public system, Subdivisions or PUD's, and Projects with 5 or more units. Approval from NDEP will be required before the permit can be approved.
  
- If the project is within 400' of a water main and the main does not already extend along all frontages, the water main must be extended per [CCMC 12.01.210](#). For industrial or commercial developments utilizing over four (4.0) water equivalent residential customer (WERC) values shall extend the sewer main a distance equal to the SERC value times one hundred feet (100').
  
- If water mains are being extended, hydrants are being added, or if the project requires fire sprinklers, a Water Main Analysis is required. Ensure that the following items are addressed within the Water Main Analysis using calculations and maps:
  - Current date, project address (with location map), APN number, permit number, and stamped by a Professional Engineer.
  - Confirm that there is 60 psi available at all water meters during peak day demands
  - Provide an update of the city water model using a format that is compatible with the current model (new mains only).
  - Comparing the required fire flow established by the building and safety department (UFC) and the "available" flow obtained by the actual fire flow data sheet.
  
- Growth Management: Will the project use daily water usage be 15,000 gallons or more? If so, this project will be required to go through the Growth Management Commission before the permit can be approved.
  
- Does the water meet minimum NAC separation requirements?
  - If not, ensure the areas that special construction is required is shown and called out on the plans including a description of what the special construction is.
  
- Does the water main layout meet Carson City Standard detail C-1.2.4 Typical Utility Main Locations?
  
- Are all water mains at least 10 feet away from any trees, boulders, or other large obstructions?
  
- Are all public water mains a minimum size of 8 inches?
  
- No more than 15 services are allowed on dead-end line without being looped. No more than 15 services can be taken out of service at a time for future repairs, gate valves are required to ensure this.

- The maximum allowed spacing between gate valves is 500 feet. Ensure the gate valves are called out and spaced.
- Water main fittings are shown as restrained and locate cans are indicated for all fittings.
- The minimum depth of cover is 3.5 feet while the typical depth of cover is 4 feet.
- For T's in water mains, unless otherwise specified by the water department, all valves should be located at the T.
- All valves need to be mechanically restrained otherwise specified. Ensure all callouts for the valves include that they are to be mechanically restrained.
- If your project includes a hot tap, ensure the hot tap is called out and have a note stating, "All hot taps 4" and larger are to be done by city forces."
- All dead-end public water mains must end in a fire hydrant.
- Access Pads must be shown in plan view for all fire hydrants, see detail C-3.1.7.1
- Air release valves are shown at high points in the main in the plan view.

### **Sewer and Water Lateral**

- If your project includes a 4" or larger hot tap, ensure the hot tap is called out and have a note stating, "All hot taps 4" and larger are to be done by city forces."
- A single water lateral cannot serve more than 14 parcels. Lines serving 15 or more parcels must be designed to public water main standards.
- Water meters may not be located within a driving surface and must have 24" clearance from sidewalks, hydrant access pads, and other obstructions.
- Call out the proposed water meter sizes on the site plan.
  - If the water meter is 1.5-inches or larger, please provide the proposed peak gallons per minute as well as the applicable calculations used to find the proposed peak gallons per minute.
- For water laterals to buildings show a water Full way shut off valve shown at the building.
- Does this project require a Backflow Preventer per NAC 445A standards? If so, it must be shown at the property line, in a hot box with the applicable standard detail.
  - A single check valve is only accepted for a private fire hydrant or request by the water department.

If a fire line is needed, is it shown? Does it have either a Reduced Pressure Principle Assembly Backflow Preventer or a Double Check Valve Backflow Preventer? Please indicate what class of fire sprinkler system that is proposed. Class 1-3 require a double check valve; class 4-6 require a reduced pressure.

Water laterals must have horizontal clearance from sewer mains and laterals as shown in standard detail C-3.1.2. The minimum vertical clearance must be noted. Apparent vertical conflicts may be required to be detailed.

Is there an existing Reduced Pressure Principle Assembly Backflow Preventer or Double Check Valve Backflow Preventer?

If so, does it meet current standards (ie: above ground, at the property line, in a hot box)?

Noncompliant backflow preventers will be required to be brought to current standards for additions, significant TI's and Remodels, and project with significant plumbing changes.

All water and sewer laterals are required to be at least 10 feet away from any trees.

SS Cleanouts (min 100', at structure, at property line, at 90-degree bends)

Water and sewer laterals are required to be perpendicular to the main.

Placement of the water meter and sewer laterals must meet Carson City Standard detail C-1.2.5-Typical Lateral Locations.

### **Surface Improvements, Traffic, Layout, and Circulation**

If you are required to complete a Traffic Impact Study (see triggers listed in CCDS 12.13), ensure that the study contains all of the content required per CCDS 12.13.

If the Traffic Impact Study requires mitigations, ensure they are shown on the site plans.

If new streets are proposed, ensure all Class "A" Survey monuments are shown on the site plan and are called out citing the standard detail.

If new streets are proposed, do Street names match naming convention without phonetic conflicts? Ensure the name has not been reserved or does not closely match an existing name by running it through the Carson City Street Name Search (<http://ccapps.org/StreetNames/>).

Do sidewalk slopes meet ADA requirements?

Are slopes called out for ADA ramps at steep roadway sections (>5%)?

Are all new and existing sidewalks 5 feet wide?

Are streetlights shown in correct locations?

- If a cluster mailbox is required, ensure it is shown on the site plan with the required streetlight.
- Are easements and lot lines correctly shown?
- Are parking areas paved and correctly striped?
- Is other traffic striping and signage shown correctly?
- Do driveways meet width/slope/spacing requirements?
- Do streets meet vertical and horizontal curve requirements, and do alignments make sense?
- Do the landscaping plans show water/sewer/storm drain, and show a minimum of 10 feet from trees.
- Are there sight distance issues with landscaping or intersections on curves (trees near sight triangles must be dimensioned from the curb to ensure correct placement)?

#### **Standard Details**

- All related, standard details are included in the plan set and are the most recent version.
- Do the callouts on the site plans include references to the applicable standard details where necessary for clarity.

#### **Prior to Permit Issuance:**

- Applicant has provided quantities or engineer's estimate for permit creation.
- Has a completed materials testing agreement been submitted?
- Once all corrections are made, a CAD and PDF file of the civil plans must be emailed to our engineering reviewer. CAD drawings must be AutoCad 18 or later and contain a Wblock of all utilities for public dedications. PDF must be labeled "Conformed Drawings".