



**City Clerk's Office**  
 1 E First Street  
 2nd Floor  
 Reno, NV 89501  
 775-334-2030  
 CityClerk@reno.gov



## City of Reno Notice of Appeal Form

Please complete this form to appeal a decision made by a City official, a hearing examiner, or the Planning Commission.

To be considered complete, the appeal must: (1) be in writing; (2) provide information addressing all of the items below; (3) be accompanied by the required appeal fee adopted by the City Council; and, (4) submitted to the City Clerk's Office or emailed to cityclerk@reno.gov.

**An incomplete form will be returned to you, and may result in a delay in scheduling your appeal.**

In addition, all appeals must be filed within the applicable period of limitations. For example, an appeal of a Planning Commission decision must be submitted to the City Clerk's Office within ten business days after the date of filing of notice of the decision with the City Clerk. (The City Clerk's Office maintains a list of common periods of limitations available upon request.)

**Untimely appeals will be rejected by the City Clerk, and any appeal fees paid will be returned.**

### 1. Type of Appeal (please select only one)

RMC: Title 18 Code

RMC: Administrative Code

- Planning Commission Decision
- Hearing Examiner Decision
- Minor Deviation
- Minor Conditional Use Permit
- Site Plan Review
- Administrative Interpretation

- Code Enforcement Citation
- Business License
- Building Permit
- Sign Permit
- Other:

### 2. Appellant Information:

Appellant Name: Michael Powell

Authorized Representative: \_\_\_\_\_

Address: 2640 Outlook Dr., Reno, NV 89509

Telephone No.: 512-351-2494

Email Address: michael-powell@earthlink.net

**3. Brief description of the action, decision, or order being appealed. (Please reference the project name, address, case number, citation number, or permit number, as applicable. Attach additional sheets, as necessary.)**

BLDG23-03075, Issued 17 Oct 2023, Walls and fence  
BLDG23-05279, Issued 6 Dec 2023, Grading  
Both permits pertain to 2600 Outlook Dr., APN 018-253-15.

BLDG23-03075 includes 350 feet of concrete wall including 155 feet of wall built with zero offset from the property line. The concrete of this structure will weigh approximately 140 tons; it is massive and permanent. On top of the wall, a fence made by hanging shade fabric between posts will be built. The total wall/fence height will be six- to ten-feet from natural grade.

BLDG23-05279 calls for re-grading 0.3 acres and moving 450 cubic yards of fill including moving from two feet to four feet of fill to the property line. Last Chance ditch is downhill from the project.

**4. Describe in detail how the action, decision, or order being appealed impacts you or your property, as applicable. (Attach additional sheets, as necessary.)**

The property that my wife and I own, 2640 Outlook Drive, shares a property line with 2600 Outlook Drive.

City of Reno Development Services has issued permits to build 155 feet of concrete wall on the property line ranging in height from two to four feet above natural grade and to move fill from two to four feet deep to the property line.

In addition to violating provisions of Reno Municipal Code (RMC) and the City of Reno Public Works Design Manual, the walls and grading will harm my property interests in at least the following ways:

1) Disruption of existing surface drainage: The existing surface drainage from my property will be blocked causing erosion on my property and damage to my existing fence.

2) Discharge of surface drainage across property line: Surface drainage from the 2600 Outlook parcel will be directed across the property line to my property causing erosion on my property and damage to Last Chance ditch.

3) Creation of an unattractive neighborhood feature: On top of the concrete wall on the property line, a fence constructed by hanging shade fabric between posts will be ugly and will be visible from my property as well as Belford Rd. and Outlook Dr. The wall/fence will be six feet in total height in the front yard and will range from eight feet to ten feet in total height in the back yard. This will negatively affect my property value.

Development Services has told me that any problems caused by the planned wall would be mine to deal with in civil court. This is unacceptable.

**5. Describe in detail the reason(s) why the action, decision, or order being appealed should be reversed, modified or set aside. (Attach additional sheets, as necessary.)**

BLD23-03075 and BLD23-05279 violate at least the following provisions of RMC and the City of Reno Public Works Design Manual (PWDM):

- 1) RMC 18.04.1404 and RMC 18.04.302(e)(2). Prohibit fill from being placed within five feet of a residential property line for all land-use types.
- 2) RMC 18.04.301 and PWDM 202.2.2.2 item 1. "Existing surface drainage from adjoining property shall be perpetuated through the development."
- 3) RMC 18.04.301 and PWDM 202.2.2.2 item 2. "Surface drainage from a developed area shall not cross any property line."
- 4) RMC 18.04.301 and PWDM 202.2.2.6. "All plans adjacent to or containing an irrigation or water supply ditch shall require the signature of the ditch company on the face of the plans."

See the attached "Appeal Form Section 5 Continuation" (7 pages) for details.

**6. Please identify and attach all documentation/evidence that you would like considered supporting your appeal. (Attach additional sheets, as necessary.)**

- 1) Annexation and Land Development Code, Article 3 Grading, Erosion Prevention, and Sedimentation Control (9 pages)
- 2) Annexation and Land Development Code, Article 14 Residential Adjacency (5 pages)
- 3) City of Reno Public Works Design Manual, applicable pages only (28 pages)
- 4) Site Plan for BLD23-03075, page 3 enlarged (1 page)
- 5) Site Plan for BLD23-05279, page 4, enlarged (1 page)

**7. Relief or action sought. (Attach additional sheets, as necessary.)**

Rescind permits BLD23-03075 and BLD23-05279.

The permits should not be re-issued until all requirements of Reno Municipal Code Annexation and Land Development code and the Public Works Design Manual are met.

**Appellant or Authorized Representative**

Signature (Print Name):

Michael R. Powell, 5 Feb 2024

By checking this box, I agree information is complete and I have authority to sign this form.

For Office Use:

Hearing Date: March 13, 2024

Hearing Time: 6 pm in Person

Hearing Location: 1E First Street Reno NV  
(Council chambers)

Via Zoom (Link emailed to information indicated above at least 5 business days prior to hearing)

Received by: BT

## Violations of RMC and PWDM by BLD23-03075 and BLD23-05279

### **1) RMC 18.04.1404 and RMC 18.04.302(e)(2)**

These two paragraphs prohibit fill from being placed within five feet of a residential property line *for all land-use types*. The permits allow fill to be placed at the property line.

#### Explanation:

RMC 18.04.1404(a)(1) states that grading will “not place any fill for a distance of 5 feet from the shared property line.” (I’ll call this the “five-foot rule” from here on out.) This paragraph lies within Article 14 on Residential Adjacency, which “applies to all nonresidential development built on or within 150 feet of any property in a residential zoning district.” So, using only this paragraph, the 5-foot rule would not apply in this situation since neither 2600 Outlook or 2640 Outlook are zoned non-residential.

However, RMC 18.04.302(e)(2) expands the five-foot rule from non-residential properties adjacent to residential properties to *all* properties adjacent to residential properties.

Specifically, Article 3 Grading, Erosion Prevention, and Sedimentation Control, Section 18.04.302 Limits on Grading (Cut and Fill), subparagraph 18.04.302(e)(2) states:

“Fill slopes adjacent to residentially zoned property shall comply with the standards in Section 18.04.1404, Grading, *for all use types*.” (Emphasis added.)

Since the grading permit (BLD23-05279) allows fill to be moved within five feet of the property line, the permit is in violation of RMC, the permit must be rescinded. Further, without fill to retain, the concrete wall on the property line cannot be classified as a retaining wall, so the building permit for the wall and fence (BLD23-03075) must be rescinded.

#### Administrative Appeal Hearing (14 Nov 2023 and 9 Jan 2024)

At the administrative appeal hearing, Development Services claimed the five-foot rule applies only to non-residential properties adjacent to residential properties. They simply ignore paragraph 18.04.302(e)(2). Their position is that paragraph 18.04.302(e)(2) is meaningless and it never applies in any situation. This is incorrect for two reasons:

1) RMC 18.04.302(e)(2), which is in the “Limits on Grading” section of RMC, refers *specifically and exclusively* to section 18.04.1404 Grading. RMC 18.04.302(e)(2) does *not* refer to the entirety of Article 14, Residential Adjacency and does *not* refer to the applicability paragraph of

Article 14. Therefore, RMC 18.04.302(e)(2) is *not* nullified by the applicability paragraph of Article 14 as Development Services contends.

2) Second, by stating “for all use types,” RMC paragraph 18.04.302(e)(2), explicitly expands the the applicability of the “five-foot rule” from nonresidential development to *all* development adjacent to a residential property.

Development Services contends that the applicability paragraph of Article 14 *always* nullifies 18.04.302(e)(2), and, therefore, one homeowner would *always* be permitted to move fill to a property line shared with another homeowner. This is incorrect. In fact, a residential property adjacent to another residential property is *exactly* the situation that RMC 18.04.302(e)(2) prohibits.

At the administrative appeal hearing, instead of relying on the text of RMC paragraphs 18.04.1404 and RMC 18.04.302(e)(2), the hearing officer simply asked Development Services if it’s a problem to move fill within five feet of the property line in this situation. The answer was “no,” and that apparently resolved the issue for the hearing officer.

#### Remedy

The letter and intent of RMC 18.04.1404 and RMC 18.04.302(e)(2) are clear: Fill cannot be placed within five feet of *any* shared residential property line. Therefore, the permits must be rescinded.

### Reno Municipal Code and Public Works Design Manual (PWDM) Violations

Per RMC 18.04.301, “all land-disturbing activity, including without limitation, grading or tree/vegetation clearance, shall comply with all applicable city standards, including without limitation, the Public Works Design Manual.”

The planned grading fails to comply with the City of Reno Public Works Design Manual (PWDM), whose “requirements ... apply to public and private improvements,” in at least the following ways:

#### **2) RMC 18.04.301 and Public Works Design Manual paragraph 202.2.2.2 part 1**

This paragraph states:

“Existing surface drainage from adjoining property shall be perpetuated through the development.”

The planned concrete wall on the property line and movement of fill to the property line will block the existing surface drainage from 2640 Outlook Dr.

Explanation:

As indicated on the site plans approved by Development Services, the parcel that my wife and I own (2640 Outlook Dr.) lies uphill from the 2600 Outlook Dr. Therefore, surface drainage from 2640 Outlook Dr. flows under the fence to 2600 Outlook Dr. This occurs along the length of the approximately 130-foot long existing fence that separates the two properties, but the slope and water flow is most pronounced along the west half of the two parcels (i.e. the front and side yards).

During storms, the water in my front and side yards is so heavy that ruts six to twelve inches deep are cut into the ground as the water flows diagonally toward and under the fence as it heads downhill. In the ten years I've lived here, I have filled these ruts an estimated six to eight times, twice in the past year alone.

PWDM 202.2.2.2 clearly states that "existing surface drainage from adjoining property shall be perpetuated." Since the building permit for the wall and fence (BLDG23-03075) includes a concrete wall on the property line and the grading permit (BLD23-05279) allows fill to be moved to the property line, either of which would disrupt the existing surface drainage from my property, both permits violate RMC and should be rescinded.

Administrative Appeal Hearing

During the 9 Jan 2024 hearing, the City Attorney's Office argued that PWDM 202.2.2.2 does not apply. I was asked if I had a drainage easement, implying that I need a drainage easement in order to continue draining surface water to the adjoining downhill property (2600 Outlook Dr.).

This, of course, is not true. My house (2640 Outlook Dr.) was built in 1961, prior to the adoption of the City of Reno Public Works Design Manual. The existing surface drainage from the 2640 Outlook parcel to the 2600 Outlook parcel has been happening for at least 63 years. Whether or not a drainage easement is required now is irrelevant because I am not the one re-grading my property.

If drainage easements on new development or re-development are now required, the existing surface drainage here would be considered a "nonconformity" or "nonconforming use." Per RMC 18.09 Rules of Construction and Definitions, Article 4 All Other Terms Defined, a nonconforming use is "a use or activity which was lawful prior to the adoption, revision, or

amendment to this Title, but which fails, by reason of such adoption, revision, or amendment, to conform to the present requirements.”

Therefore, the Assistant City Attorney’s argument that PWDM 202.2.2.2 does not apply is not correct, and the existing surface drainage from my property must be perpetuated.

### Remedy

Both building permits block “existing surface drainage from an adjoining property,” so both permits are in violation of RMC and, therefore, both permits should be rescinded.

### **3) RMC 18.04.301 and Public Works Design Manual paragraph 202.2.2.2 part 2**

PWDM paragraph 202.2.2.2 also states:

“Surface drainage from a developed area shall not cross any property line.”

Currently, surface drainage from the 2600 Outlook parcel is naturally spread across the width of the property before flowing into Last Chance ditch. The planned walls and grading will concentrate surface drainage and deliver it to a small area adjacent to the shared property line.

At the southeast corner of the planned project, water from drainage pipe in the planned concrete wall and water from a shallow drainage channel (the designed flow line) is being directed southeast across the property line onto the 2640 Outlook parcel. The plans call for an estimated 1/4<sup>th</sup> of 2600 Outlook (0.15 acres) to drain to 2640 Outlook before reaching Last Chance ditch.

### Explanation:

1) The plans call for approximately 350 feet of concrete wall, including 155 feet of concrete wall on the property line. The designed wall includes “4-inch perforated pipe [to] drain to daylight” at the inside base of the wall to drain the enclosed area downhill to the southeast corner of the concrete wall enclosure.

This drainage pipe will release water immediately adjacent to the property line approximately 40 feet from Last Chance Ditch. At this point, as indicated on the site plans, the land slopes slightly toward my property. Approximately 20 feet from Last Chance Ditch, the slope of the land changes sharply toward my property.

Given that water flows directly downhill and perpendicular to contour/elevation lines, the approved site plans show that water drained from the area within the concrete wall enclosure will cross the property line prior to reaching Last Chance Ditch. This violates RMC 18.04.301 and PWDM 202.2.2.2.

2) The plans call for a shallow drainage channel between the approximately four-foot gap between the concrete wall and the four-foot rockery wall. This designed flow line will carry surface drainage from the front yard of the house (the southwest corner), along the south side of the house, and the back yard of the house (the southeast corner). This surface drainage will also include water that runs off the roof from the south end of the house.

In addition, a drainage pipe inside the four-foot rockery wall to the north will also release water into the designed drainage channel.

This surface drainage will be channeled to a spot approximately ten feet north of property line. At this point, the land slopes slightly toward my property and approximately 20 feet from Last Chance Ditch, the slope of the land changes sharply toward my property.

The approved site plans show that surface drainage will cross the property line prior to reaching Last Chance Ditch. This violates RMC 18.04.301 and PWDM 202.2.2.2.

### Administrative Appeal Hearing

During the 14 Jan 2024 hearing, Development Services stated that surface drainage from the designed flow line would turn to the east away from the property line instead of flowing directly downhill (i.e. perpendicular to the elevation/contour lines). The individual making this argument was interpreting a line pointing to the lowest point of the designed flow line as some sort of flow line itself. (On the grading site plan, that pointer line is labeled "4644.72, FL," which is the elevation in feet of the designed flow line as it exits the gap between the two walls.)

In fact, this is not an actual channel or other structure that somehow hovers above as the land slopes away. The planned drainage channel (i.e. flow line) ends at the edge of the five-foot easement on either side of the city sewer line. Therefore, a structure to bend the surface drainage away from the property line cannot be built there. An existing sewer line manhole would also physically be in the way.

I suspect the discussion about where the water will flow once it exists the drainage channel was confusing to anyone who is not familiar with reading technical documents. The Hearing Officer did not ask any questions about this issue.

## Remedy

Both building permits cause surface drainage to cross a property line, so both permits are in violation of RMC, and, therefore, both permits should be rescinded.

### **4) RMC 18.04.301 and Public Works Design Manual paragraph 202.2.2.6**

The City of Reno Public Works Design Manual paragraph 202.2.2.6 states:

“All plans adjacent to or containing an irrigation or water supply ditch shall require the signature of the ditch company on the face of the plans.”

Last Chance Irrigation Company has not signed off on either set of plans. There is no evidence whatsoever that Last Chance Irrigation Company has seen either set of plans. On 12 Jan 2024, Last Chance Irrigation Company’s ditch rider was at my property (because I’m replacing a section of fence the neighbor removed) and he did not think the company had seen the site plans.

A “License and Indemnification Agreement” between Last Chance Irrigation Company and Mrs. Carol Reno (the owner, as sole trustee of Reno Living Trust) was executed on 2 March 2023, and was received by Development Services on 6 March 2023. This agreement includes no description of what work Last Chance Ditch Company is approving.

This “License and Indemnification Agreement” was executed nearly seven months before the fence/wall site plan (25 Sep 2023) and grading site plan (26 Sep 2023) were finalized.

Similarly, an e-mail from Last Chance Ditch Co., stamped “Dec 15 2022,” was nine months prior to the existence of the site plans, and approved only a “fence,” not any walls or any grading.

Approval from the ditch company matters to me because when the surface drainage from this project runs across my property, erodes the ditch embankment, and carries sediment into the ditch, I want the ditch company to know that they approved this foreseeable problem and the owner of 2600 Outlook Dr. needs to fix it, not me.

## Administrative Appeal Hearing

During the 14 Jan 2024 hearing, Development Services stated that they had a “letter of approval” from the Last Chance Irrigation. The Hearing Officer did not require this letter of approval to be produced or shown.

On 22 January 2024, I requested the Last Chance Irrigation Company's "letter of approval" from Development Services. On 26 January 2024, the only document produced by the public records request was the March 2023 "Indemnification and License Agreement."

### Remedy

Neither the wall/fence plans nor the grading plan have been signed by the ditch company, so both permits are in violation of RMC, and, therefore, both permits should be rescinded.

## Article 3 Grading, Erosion Prevention, and Sedimentation Control

### 18.04.301 General Compliance with City Standards

In addition to the grading, erosion prevention, and sedimentation control provisions in this article, all land-disturbing activity, including without limitation, grading or tree/vegetation clearance, shall comply with all applicable city standards, including without limitation, the Public Works Design Manual.

### 18.04.302 Limits on Grading (Cut and Fill)

- (a) **Authority** NRS Section 278.250 and NRS Chapter 445A authorize the adoption of grading regulations.
- (b) **Purpose** The purpose of this section is to:
  - (1) Minimize environmental damage associated with grading;
  - (2) Encourage balancing the site and reduce importing and exporting soil;
  - (3) Limit visual scarring;
  - (4) Limit unnecessary site disturbance; and
  - (5) Limit impacts to water quality during grading.
- (c) **Grading Permit Required** No person shall excavate, fill, or otherwise alter the existing grade of any property without first obtaining a grading permit according to the procedures and criteria stated in subsection 18.08.606(b).
- (d) **Major Site Plan Review Required** An applicant shall obtain a major site plan review permit when engaged in any grading resulting in cuts deeper than 20 feet and/or fills greater than ten feet in height, for a hillside development meeting the criteria in Section 18.04.402, Applicability; within a major drainageway meeting the criteria in Section 18.04.104(c), Applicability; or within the Parks, Greenways, and Open Space (PGOS) District, except for paths, public recreational amenities, or environmental restoration.
  - (1) **Findings** For developments ten acres or more in area, the following findings shall be made prior to granting a major site plan review, in addition to the general major site plan review findings:
    - a. The proposed project mitigates environmental degradation, including slope failure, erosion, sedimentation, and stormwater run-off;
    - b. The proposed project utilizes grading practices that are appropriate for hillsides and designed to minimize the visibility of unsightly scarring;
    - c. The proposed project provides open space based on hillside constraints;
    - d. The proposed project adheres to applicable hillside development design standards and to Master Plan provisions related to development in sloped areas; and
    - e. The proposed project's site layout and design features adequately mitigate potential visual impacts of development near prominent ridgelines and within other visually prominent areas.
- (e) **General Grading (Cut and Fill) Standards**
  - (1) **Preservation of Stable Steep Slopes** On all projects that include slopes steeper than three to one, existing stable slopes shall be preserved unless the City determines during subdivision or development

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review that cut and fill slopes are justified and necessary in the overall design of an otherwise acceptable development.

- (2) **Fill Slopes** Fill slopes adjacent to residentially zoned property shall comply with the standards in Section 18.04.1404, Grading, for all use types.
- (3) **Location of Cut and Fill Slopes**
  - a. Wherever feasible, cut and fill slopes adjoining parcel boundaries shall be located within the parcel that the slope is visible from or within a common area.
  - b. Tops and toes of cut and fill slopes steeper than 5:1 at property boundaries shall not encroach into the right-of-way.
  - c. Tops and toes of cut and fill slopes steeper than 5:1 shall be located at least 18 inches behind a sidewalk and at least six feet behind the face of a curb where no sidewalk is provided.
  - d. Cut and fill slopes exceeding 5:1 shall not be located within ten feet of sewer or storm drain access locations.
  - e. The Administrator may approve exceptions to these standards in consultation with the City Engineer for hillside developments and other situations where level areas are not warranted for future sidewalk construction or infrastructure maintenance purposes.
- (4) **Noxious Weed Abatement** Applications proposing grading activities on sites with noxious weeds, as defined by the State of Nevada, shall prepare and implement a noxious weed monitoring and management plan. The plan shall address construction and post construction activities to monitor, eradicate, and prevent the spread of noxious weeds. The plan shall be implemented and enforced throughout the life of the project.
- (5) **Re-Vegetation Required After Final Grading**
  - a. Temporary stabilization shall be applied in accordance with the Truckee Meadows Construction Site Best Management Practices Handbook and in accordance with the State's General Permit.
  - b. Cut and fill slopes steeper than 3:1 shall have riprap (class 400) and revegetation. Riprap shall be backfilled with topsoil to the average depth between placed riprap filling the voids and creating planting pockets.
  - c. Soil tests shall be conducted after final grading operations are complete and prior to planting to determine required soil amendments that may be needed for the site.
  - d. Re-vegetation shall commence the following late fall with approved security and temporary irrigation (if necessary) provided to ensure proper re-establishment of disturbed areas.
  - e. All slopes disturbed by grading, including on site/in-lot slopes that are not necessary for construction staging, shall be reseeded with native shrubs, grasses, etc., consistent with existing on-site native vegetation upon completion of final grading. These areas shall be bonded to ensure proper re-establishment of the vegetation, with temporary irrigation if deemed necessary, based on seed mix, and time of year.
  - f. The re-vegetation plan shall include plans to stockpile existing topsoil and vegetative strippings and reapply the material to all disturbed areas that are not formally landscaped.
  - g. Re-vegetation shall be a uniform perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the unpaved areas and areas not covered by permanent structures.

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- h. Rocks used for riprap and retaining walls shall be of a color consistent with the site, or landscaping shall be installed sufficient to provide 20 percent coverage in three years.
  - i. Establishment of coverage will be judged at the end of the second or third year of installation by community development staff in the form of an administrative decision, subject to appeal.
  - j. The Administrator shall monitor the re-vegetated areas to identify problems that could prevent or interfere with successful re-vegetation projects. Monitoring activities should react to problems which include: the establishment of invasive weeds, erosion (rilling) caused by sudden or steady runoff that can damage restored areas, failure or lack of vigor in introduced plants, unfavorable amounts of moisture (too little or too much), and damage resulting from human trespass.
- (6) **No Tracking of Grading Material onto Streets or into Storm Drains** Material loosened by grading activity shall not be tracked onto adjacent streets or washed down storm drains. The drive apron onto the street shall be stabilized with pavement, gravel, or other approved covering.
- (7) **Site Design** Applicants for a grading permit with a retaining wall, cut slope, or fill slope exceeding four feet in height shall comply with the slope treatment standards for hillside developments in Section 18.04.409, Slope Treatment, to the satisfaction of the Administrator.
- (8) **Tree Protection** Applicants for a grading permit shall comply with the tree protection standards in 18.04.105, Tree Protection, as applicable.

### 18.04.303 Control of Construction Site Discharge

- (a) **Enabling Clause** The Nevada Department of Environmental Protection (NDEP) has issued a discharge permit to Reno, Sparks, and Washoe County requiring the development, implementation, and enforcement of a regional storm water quality management program. The storm water discharge permit is a component of a national pollutant discharge elimination system (NPDES) established by the Clean Water Act Amendments of 1987. An element of the storm water quality management program is the reduction of pollution from construction sites to the maximum extent practicable in accordance with the NPDES permit issued by NDEP.
- (b) **Purpose and Intent** The purpose and intent of this section is to:
- (1) Promote and protect the health, safety, and general welfare of the citizens of Reno and enhance and preserve the quality and value of our resources by regulating construction activities.
  - (2) Provide for the protection of storm water, ground water, water bodies, watercourses, and wetlands pursuant to and consistent with the Clean Water Act, and NPDES permit granted to the City of Reno.
  - (3) Manage and control the amount of pollutants in storm water discharges, soil erosion, sediment discharge, mud and dirt deposits on public roadways, and municipal storm sewer systems caused by or a result of construction activities.
  - (4) Ensure adequate drainage, storm water management, and soil conservation measures are utilized at the site of any construction activity.
- (c) **Applicability** Off-site impacts of erosion and sedimentation from a construction site are prohibited and polluting substances such as construction materials and wastes shall be contained on the site where they cannot drain or be transported by storm water into a water body, channel, or storm drain. Best Management Practices shall be implemented for all construction sites and are mandated for construction sites with a disturbed area of one acre or greater or one acre or less if in a sensitive area or part of a larger planned development according to the performance standards of the "Truckee Meadows Construction Site Best Management Practices Handbook" ("BMP Manual") together with such addendum, all of which are on deposit in the office of the City Clerk, are adopted by reference and incorporated here in and made a part hereof as if set forth in full.

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(d) **Regulatory Consistency** This section shall be construed to assure consistency with state and federal laws, rules and regulations, including the Clean Water Act and all acts amendatory thereof or supplementary thereto; all NPDES permits issued to the City of Reno; and any other provisions of the Reno Municipal Code. No permit or approval issued pursuant to this section shall relieve a person of the responsibility to secure permits and approvals required for activities regulated by any other applicable rule, code, act, permit, or ordinance. Compliance with this section does not exempt any person from complying with other applicable ordinances, rules, codes, acts, or permits.

(e) **Construction Site Discharge Regulations and Requirements**

- (1) Construction permit submittal is required on all projects that may require a grading, site development, building, site drainage, or encroachment permits and will disturb one or more acres of land (including public works projects).
- (2) Prior to the issuance of a construction permit, the following shall be submitted:
  - a. Construction permit submittal checklist;
  - b. Performance standards compliance checklist;
  - c. Copy of notice of intent;
  - d. Copy of receipt from NDEP or permit; and
  - e. Proof of the SWPPP.
- (3) The installation and maintenance of storm water controls are to be in accordance with the standards as set for in the BMP Manual.
- (4) At the end of construction when the site has been finished and cleaned and permanent erosion controls are in place, a revegetation plan per Chapter 18.08 Administration and Procedures, together with associated security may be required by the city to assure permanent establishment of installed measures.

(f) **Administrative Fees**

- (1) The required permit fees are based on the nature or size of the permitted area and are for the purpose of providing administration, inspection, and enforcement of the provisions of this section.
- (2) The City shall collect an administrative service charge for inspection of storm water quality controls, for inspection of appropriate maintenance, for inspection of the measures at the completion of work, and for inspection of measures at the start of each phase of work. The administrative service charge is as set forth in the current resolution and any amendments thereto which establishes the service charges and fees for the City of Reno.
- (3) The above listed fees shall be doubled if the construction activity is commenced prior to the issuance of the required permit and/or installation of storm water controls. Payment of the double fee shall not preclude the City from taking any other enforcement actions within its authority.

(g) **Inspection**

- (1) All construction activities that fall within this section shall be subject to the inspection provisions provided herein.
- (2) The City maintains the right to inspect any site of construction activity. The responsible person shall schedule inspection through community development. An inspection shall be conducted prior to the initiation of construction to verify placement of storm water controls. Initial inspections shall be requested a minimum of 24 hours prior to the desired time of inspection, excluding Saturdays, Sundays, and holidays. Follow up inspections will not be scheduled but will occur as follows:

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- a. Prior to commencing construction when BMP's are in place.
  - b. At the end of construction when the site has been finished and cleaned and permanent erosion controls are in place.
  - c. Monthly for those sites with a combination of extreme factors including slopes greater than ten percent, proximity to floodplains and waterways, long project duration (more than six months), and environmental sensitivity.
  - d. Additional inspections may also occur as deemed necessary by community development.
  - e. For phased projects, the city shall inspect installed measures per the SWPPP prior to the commencement of each phase.
- (3) If an inspector determines the installed storm water controls are placing the city at risk of violating its NPDES permit, the inspector may order change to the storm water controls. If the change to the storm water controls is not acceptable or is not immediately implemented, enforcement action may be taken.
  - (4) Emergency control measures may be ordered when pollutants are leaving the site.
  - (5) A complaint of violation shall be promptly investigated.
- (h) **Enforcement**
- (1) **Authority** The Administrator is hereby authorized and directed to enforce all the provisions of this article.
  - (2) **Right of Entry** Whenever necessary to make an inspection to enforce any of the provisions of this Title or any other lawful ordinance, the Administrator or their authorized representative may enter the property at all reasonable times to inspect the same or to perform any duty imposed upon the Administrator by this section, provided they shall first present proper credentials and request entry. If entry is refused, the Administrator or their authorized representative shall have recourse to every remedy provided by law to secure entry.
  - (3) **Notice of Violation** Whenever the Administrator finds a violation of the provisions of this article, the Administrator may issue a notice of violation in writing served on the responsible person. The notice of violation will provide a time period in which the corrective action shall be completed.
  - (4) **Stop Orders** A written stop work order may be served on the responsible person, and any such persons shall forthwith stop such work until authorized by the Administrator to proceed with the work.
  - (5) **Penalty for Violation** In addition to any other remedies under this section, a person violating any of the provisions of this article may be subject to provisions of Chapter 1.05, Code Enforcement .
  - (6) **Nevada Department of Environmental Protection** The City may, at its discretion, contact the NDEP for further enforcement.
  - (7) **Costs Accrued by City** Should the City be required to intercede in the installation, maintenance or removal of measures, said costs accrued by the City for time and material necessary to correct the defective installation, maintenance or removal of said measures, shall be levied against the property, and shall be paid in full prior to issuance of any final approval or certificate of occupancy associated with the permit, and prior to issuance of any subsequent permit or start of subsequent phase.
- (i) **Disclaimer of Liability** The degree of protection required by this section is considered reasonable for regulatory purposes and is based on scientific, engineering, and other relevant technical considerations. The standards set forth herein are minimum standards and this section does not imply that compliance will ensure against all unauthorized discharge of pollutants. This section shall not create liability on the part of the city, any agent or employee thereof for any damages that result from reliance on this section or any administrative decision lawfully made thereunder.

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### 18.04.304 Post-Construction Storm Water Quality Management

- (a) **Enabling Clause** The Nevada Department of Environmental Protection (NDEP) has issued a discharge permit to Reno, Sparks, and Washoe County requiring the development, implementation, and enforcement of a regional storm water quality management program. The storm water discharge permit is a component of a national pollutant discharge elimination system (NPDES) established by the Clean Water Act Amendments of 1987. An element of the storm water quality management program is the reduction of pollution from construction sites to the maximum extent practicable in accordance with the NPDES permit issued by NDEP.
- (b) **Purpose and Intent** The purpose and intent of this section is to:
- (1) Prevent threats to public health and safety by regulating storm water runoff discharges from applicable land development projects and other construction activities in order to control and minimize increases in storm water runoff rates and volumes, soil erosion, flooding, stream channel erosion, and non-point source pollution associated with storm water runoff.
  - (2) Control and minimize the above impacts through implementation of approved post construction storm water quality management plans that place a strong emphasis on implementing Low Impact Development (LID) principles and techniques that include, but are not limited to disturbing only the smallest area necessary, minimizing soil compaction and imperviousness in drainage and recharge areas, preserving natural drainages, vegetation, and buffer zones, and utilizing on-site storm water treatment techniques to the maximum extent practicable.
- (c) **Applicability**
- (1) Approved post-construction storm water quality management plans and storm water treatment device access and maintenance agreements are required for the following development activities unless waived according to the terms outlined Section 18.04.304(f):
    - a. Any new development involving the following:
      1. Building permits, conditional use permits, and site plan reviews that would create a new industrial, commercial, or civic structures;
      2. Any new development that would specifically enable outdoor material storage; outdoor material loading/unloading; fueling areas; outdoor work, maintenance, and wash areas; spill prevention, containment and cleanup; waste handling and disposal uses; any industrial use that has been assigned a Federal North American Industry Classification System (NAIC) code; and uses defined as "industrial" in Chapter 18.09 Rules of Construction and Definitions.
      3. Final plat and parcel maps that require improvement plans on one or more acres of land;
      4. Grading and site permits involving one or more acres of land except for individual single-family homes;
      5. Development activities defined in Section 18.04.304(c)(1)a.3-4, above, that are smaller than one acre if such activities are part of a larger common plan of development, even though multiple separate and distinct land development activities may take place at different times on different schedules;
      6. Development that will include constructed open channels and local or regional detention basins for flood management;

- 
7. Development that will disturb less than one acre of land that will also be located within or directly adjacent to environmentally sensitive areas, as defined in the Truckee Meadows Structural Controls Design and Low Impact Development Manual.
  - (2) Complete applications for applicable development permits and entitlements that have been submitted before the effective date of the ordinance codified in this section are exempt from the requirements of this section.
  - (3) Permits and entitlements that were issued before the effective date of this section shall not be subject to this section if the accompanying permit is valid.
  - (4) Permits and entitlements for individual single-family homes and tenant improvements that do not require expansion of the site shall not be subject to this section.

**(d) Application Requirements**

- (1) No applicable permit shall be issued until the post construction storm water quality management plan (as described in Section 18.04.304(e)) and storm water treatment device access and maintenance agreement are approved by the community development department.
- (2) Applications meeting the terms of Section 18.04.304(c) shall be accompanied by the following documents in order for the application to be considered complete: two copies of the post construction storm water quality management plan and two copies of the storm water treatment device access and maintenance agreement. The post construction storm water quality management plan and storm water treatment device access and maintenance agreement shall be prepared to meet the requirements outlined in this section.
- (3) Appeals of post construction storm water quality management plan disapprovals for building permits shall follow in accordance with the provisions of Subsection 18.08.307(j), Appeal, and all other appeals shall be filed with the relevant provisions of this title.

**(e) Standards**

- (1) **Post-Construction Storm Water Quality Management Plan Required for All Applicable Developments**  
A post construction storm water quality management plan shall be prepared by a professional civil engineer, registered in the State of Nevada and prepared using the "Truckee Meadows Structural Controls Design and Low Impact Development Manual" and the "Public Works Design Manual", together with all addendum, as planning and design guidance for the implementation of the post construction storm water quality management requirements described in this section. Storm water quality management plan standards are described in the "Public Works Design Manual." These documents are on deposit with the office of the City Clerk.

**(f) Waivers to Applicability**

- (1) Every applicant shall provide for storm water quality management as required by this section, unless a written request to waive the plan requirements is granted by the Administrator.
- (2) Because there may be circumstances when the post construction storm water quality treatment measures described in this section are inappropriate to meet the purpose and intent of this section, the minimum requirements for a post-construction storm water quality management plan may be waived provided that at least one of the following conditions applies to the satisfaction of the Administrator:
  - a. The proposed development is not likely to impair attainment of the purpose and intent of this section, or the site conditions are such that of the purpose and intent of this section are unattainable; or

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- b. The proposed development is listed under Section 18.04.107, Source Water Protection, and the Administrator determines that the public interest is best served; or
  - c. Provisions are made to manage storm water quality by an off-site facility,
    - 1. An off-site facility is defined as a storm water management measure located outside the subject property boundary described in the permit application for land development activity; and
    - 2. The off-site facility is required to be in place, to be designed and adequately sized to provide a level of storm water treatment and control that is equal to or greater than that which would be afforded by on-site practices, and there is a legally obligated entity responsible for long-term operation and maintenance of the storm water practice.

**(g) Performance Bond/Security**

- (1) The developer shall submit a performance security or bond prior to issuance of a permit requiring post construction storm water quality management in order to ensure that the storm water practices are installed by the permit holder as required by the approved storm water management plan. The amount of the installation performance security shall be the total estimated construction cost of the storm water management practices approved under the permit, plus 20 percent. The performance bond/security can be a stand-alone instrument or may be combined with other required performance securities. The performance security shall be forfeited for failure to complete work specified in the storm water management plan.
- (2) The performance security shall be released in full upon submission of "as built plans" and written certification by a professional civil engineer, registered in the State of Nevada, that the storm water practice has been installed in accordance with the approved plan and other applicable provisions of this section. The community development department will make a final inspection of the storm water practice to ensure that it follows the approved plan and the provisions of this section.
  - a. Provisions for a partial pro-rata release of the performance security based on the completion of various development stages can be done if each of the following is satisfied:
    - 1. At least 50 percent of the secured improvements are completed;
    - 2. The applicant has submitted an estimate of the work remaining that is sealed by a professional civil engineer registered in the State of Nevada; and
    - 3. The applicant has provided evidence in a form acceptable to the community development department of replacement security in the lower amount.
- (3) A reduction of the security may be considered once each calendar year or upon completion of 25 percent, 50 percent, or 80 percent of the secured items. The dollar amount of no one item, as set forth in the bond estimate as approved by the city, shall be reduced below ten percent of the original item amount, and further the security shall at no time be reduced below 20 percent of the original security amount until all storm water practices have been completed in a manner acceptable to the city. The following procedure is to be followed when requesting a reduction in security:
  - a. The subdivider/developer shall make a formal request in writing to the city that the security be renegotiated.
  - b. The project engineer shall provide the city with an estimate of the work remaining in the format as provided by the city.
  - c. The city will determine the total amount of security reduction allowed based on the estimated amount of work remaining as provided by the project engineer and verified by the city and shall provide the subdivider/developer with a revised bond estimate.

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- d. The subdivider/developer shall submit to the city new security, in the format as provided by the city with a revised bond estimate attached, for the storm water practices remaining.
  - e. Upon approval as to legal form of the new security by the City Attorney, the new security will be filed with the City Clerk and the old security document returned.
- (4) In no case shall a reduction in security be construed as constituting a final acceptance of storm water practices by the city, either in whole or in part.
- (h) **Maintenance and Repair of Storm Water Quality Facilities**
- (1) **Access and Maintenance Agreement** Prior to the issuance of any permit requiring post construction storm water quality management, the applicant or owner of the site shall execute a storm water treatment device access and maintenance agreement that shall be binding on all subsequent owners of land served by the storm water quality management facility. The agreement shall be approved as to form by the City Attorney's Office. The agreement shall provide for access to the facility at reasonable times for periodic inspection by the City of Reno, or their contractor or agent, and for assessments of property owners to ensure that the facility is maintained in working condition to meet design standards and any other provisions established by this article. The applicant shall record the agreement with Washoe County and provide a copy of the recorded document to the City of Reno before permits may be issued.
  - (2) **Records of Installation and Maintenance Activities** Applicants and/or owners responsible for the operation and maintenance of a post construction storm water quality management facility shall maintain records of all maintenance and repairs. These records shall be made available during inspection of the facility and at other reasonable times upon request.
  - (3) **Requirements for Maintenance** All post construction storm water management facilities shall undergo, at a minimum, an annual inspection by the persons responsible for their operation and maintenance to document and perform maintenance, repair needs, and ensure compliance with the requirements of this article and accomplishment of its purposes. These needs may include but are not limited to removal of silt, litter, and other debris from the catch basins, inlets, and drainage pipes; grass cutting and vegetation removal; and necessary replacement of landscape vegetation. Any maintenance needs found shall be addressed in a timely manner.
  - (4) **City Inspection of Storm Water Facilities** Inspections include, but are not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other contaminants or other pollutants; inspections of businesses or industry of a type which are more likely than the typical discharge to cause violations of state or federal water or sediment quality standards or the NPDES storm water permit; and joint inspections with other agencies inspecting under environmental or safety laws, reviewing maintenance and repair records; sampling discharges, surface water, ground water, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other storm water treatment practices.
  - (5) **Right of Entry for Inspection When Connection is Private to Public** When any new connection is made or when any new connection is made between private property and a public drainage control system or sanitary sewer, the property owner shall grant to the City of Reno on a form provided by or acceptable to city the right to enter the property at reasonable times and in a reasonable manner for the purpose of inspection. This includes the right to enter a property when it has a reasonable basis to believe that a violation of this section is occurring or has occurred, and to enter when necessary for abatement of a public nuisance or correction of a violation of this section.

## Article 14 Residential Adjacency

### 18.04.1401 Purpose

The purpose of this article is to promote compatible transitions between land use areas of differing intensities and to reduce potential negative impacts that may occur when mixed-use and nonresidential development is located near residential zoning districts.

### 18.04.1402 Applicability

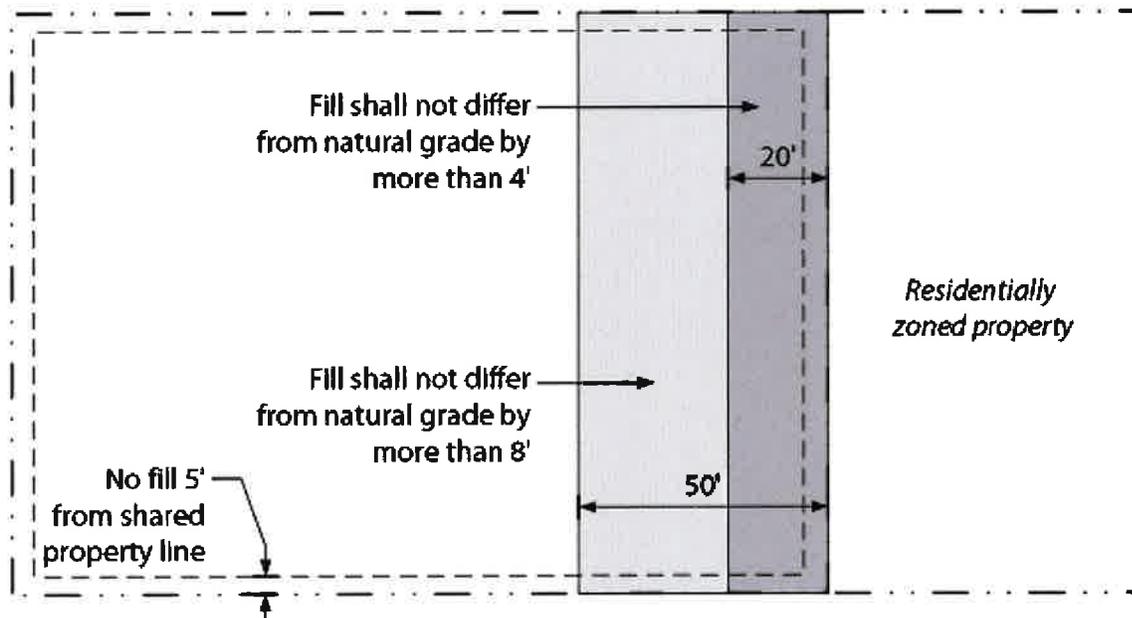
This article applies to all nonresidential development built on or within 150 feet of any property in a residential zoning district, exempting nonresidential developments that are no greater than three stories in height or 10 acres in size and are separated from residentially zoned property by a freeway or major arterial. For mixed-use development, this article applies to nonresidential project components, including access and circulation routes.

### 18.04.1403 Use Limitations

- (a) Where these residential adjacency standards apply, the following uses or features shall be prohibited as principal or accessory uses:
  - (1) Public address systems that exceed the limits established in Section 18.04.1408, Noise; and
  - (2) Outdoor storage located between a principal building and a residentially zoned property.
- (b) Drive-through lanes shall not be located within 100 feet of residentially zoned property unless separated by a principal building, or a six-foot-tall solid screen fence, wall, or landscaped berm, in addition to at least ten feet of landscaping, or where all owners of residentially zoned property within 100 feet of the drive-through lane provide written consent.

### 18.04.1404 Grading

- (a) All grading for subdivision improvements, conditional use permits, or other discretionary or building permits shall:
  - (1) Not place any fill for a distance of 5 feet from the shared property line.
  - (2) For a distance of 20 feet from the shared property line with a residentially zoned property, fill depths shall not exceed the natural grade by more than 4 feet.
  - (3) For a distance of 50 feet from the shared property line with residentially zoned property, fills depths shall not exceed the natural grade by more than 8 feet. See Figure 4-42, below.



**Figure 4-42: Grading Near Property Line**

- (b) Grading for nonresidential development adjacent to single-family zoned property shall not include fill slopes which exceed the pad grades of the adjoining single-family residences within 20 feet of the property line of the single-family residence.
- (c) Exceptions or variations from these standards may be approved with written consent of the adjoining residential property owner or when the decision-making body determines that the proposed variation from the strict application of these standards is consistent with development patterns in the area and would not significantly impact the adjoining residence. Alternative features for compatibility may be required when approving exceptions.

#### 18.04.1405 Site and Building Orientation

- (a) **Site Orientation**
  - (1) To the extent feasible, nonresidential developments shall be designed with higher activity areas, such as parking, circulation, loading, and delivery areas, oriented away from any abutting residential uses.
  - (2) Where site limitations necessitate higher activity levels abutting residential uses, additional landscaping and/or screening may be required.
- (b) **Building Configuration**
  - (1) Multi-building developments shall be configured to locate the tallest and largest structures within the core of the site and provide a gradual decrease in building height and mass towards adjacent residential land uses.
  - (2) Horizontally integrated mixed-use developments shall locate nonresidential uses away from the adjacent residential district.
- (c) **Building Facades** Developments shall be constructed such that the facade design, including roof lines and roof treatments, is consistent on all sides of the building that are visible from public streets or residential districts.

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- (d) **Transitions** To reduce impacts on residentially zoned property, buildings constructed within 150 feet of a residentially zoned property shall comply with the standards outlined in subsection 18.04.903(c)(1), Additional Setbacks and Stepbacks for Compatibility.

#### **18.04.1406 Signage Adjacent to Residential**

- (a) No advertising signage shall be permitted on a rear or side building facade that faces an abutting residentially zoned property.
- (b) All advertising signage adjacent to and visible from residential districts shall be carefully designed to minimize visibility from adjacent residential districts. Internally illuminated signs may not be oriented toward residential districts. Signs may only be illuminated during allowed hours of operation per subsection 18.04.1403, Use Limitations.

#### **18.04.1407 Spillover Lighting**

In addition to complying with the general standards in Article 13, Exterior Lighting, development subject to the residential adjacency standards in this article shall comply with the following:

- (a) **Lighting Standard** Lighting from a nonresidential property shall not create greater than 0.5-foot candle of spillover light at a property line of any property zoned LL (all districts), SF (all districts), or MF-14.
- (b) **Redirecting/Screening of Light Sources** All sources of light, including security lighting, illuminated signs, vehicular headlights, and other sources, shall be directed away from residentially zoned property; or screened so that the light level stated in subsection 18.04.1407(a), above, is not exceeded.
- (c) **Lighting Near Residential Areas** Light fixtures and standards in or within 100 feet of any single-family residential zoning district shall not exceed 18 feet in height. The Administrator may permit additional height provided such lights are a sharp cut-off lighting system and shorter light fixtures are not feasible.
- (d) **Exclusions for Existing Higher Light Levels** Where existing light levels already exceed the standards of this article as of the effective date of this Title, the subject source may not increase existing levels.

#### **18.04.1408 Noise**

(a) **Noise at Residential Property Lines**

- (1) **Measurement** Measurement of noise shall be made at the residential property line with a sound level meter and octave band analyzer meeting the standards prescribed by the American Standards Association.
- (2) **Permissible Noise Level**
- a. **Nighttime Noise Level** Noise levels shall not exceed 49 db leq or 49 db for a single event occurring on a re-occurring basis at a residentially zoned property line between 10:00 p.m. and 7:00 a.m.
- b. **Daytime Noise Level** Noise levels shall not exceed 65 db leq or 65 db for a single event on a reoccurring basis at a residentially zoned property line.
1. Noise associated with temporary construction activity is exempt from the standards from 6:00 a.m. to 7:00 p.m.
2. Airport airplane operations are exempt from these standards.

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- (b) **Exclusions for Existing Higher Ambient Noise Levels** Where existing ambient noise levels already exceed the standards of this article as of the effective date of this Title, the subject source may not increase existing levels.

#### **18.04.1409 Odor**

(a) **Generally**

- (1) Uses and activities that produce continuous, regular, or frequent odors and/or emissions, detectable beyond the boundary of the property from which the odor originates, may be prohibited, in whole or in part, if the odor or emission in question is a known health risk, danger, or if the Administrator judges such odor or emission to be harmful to the rights of others to enjoy their property.
- (2) All uses and activities shall be sufficiently insulated so no unreasonable odor can be detected off premises.

- (b) **Service Areas** Service areas containing outdoor garbage or recycling containers shall not be located within 25 feet of an adjacent residential district unless no other feasible options are available and the project is designed to mitigate impacts on adjacent properties.

#### **18.04.1410 Off-Street Parking**

- (a) To minimize the impacts of off-street parking for nonresidential uses on residential areas, parking shall be established in one or more of the locations listed below. The locations are listed in priority order from highest to lowest; the applicant shall select the highest feasible location from this list and shall demonstrate why that application was selected over other alternative locations.

- (1) Adjacent to off-street parking lots serving nonresidential uses on abutting lots;
- (2) Adjacent to lot lines abutting nonresidential or mixed-use development;
- (3) On the side of a corner lot not facing the primary street frontage;
- (4) Behind the building; or
- (5) Adjacent to lot lines abutting residential uses.

- (b) If nonresidential parking is located within 30 feet of residential districts and is not separated by a principal building, wall screening shall be provided in accordance with Subsection 18.04.808(b), Screening Between Land Uses, with the landscape area increased to 10 feet.

#### **18.04.1411 Cut-Through Traffic**

Sites shall avoid access locations that would encourage cut-through traffic through adjacent residentially zoned properties.

#### **18.04.1412 Use of Alleys**

Commercial truck and automobile traffic shall be prohibited on alleys that are shared with residentially zoned properties between the hours of 10:00 p.m. and 7:00 a.m. This includes, but is not limited to, deliveries, and commercial parking lot access. Garbage collection is governed by a franchise agreement and is not subject to this standard.

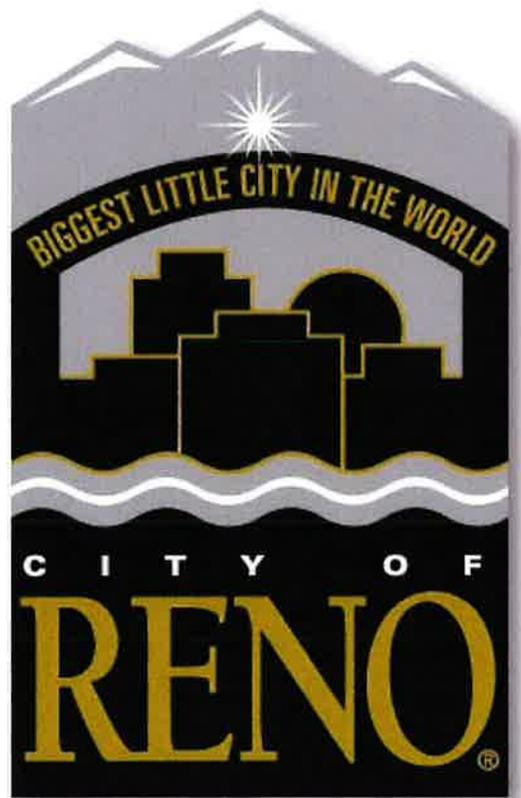
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### **18.04.1413 Loading Activities**

- (a) Off-street loading areas shall not be located within 30 feet of an adjacent residential district unless no other feasible options are available, and the project is designed to mitigate impacts on adjacent properties.
- (b) Service and loading areas shall be screened from residential districts pursuant to subsection 18.04.808(c), Screening of Outdoor Service Areas, Utilities, and Equipment.
- (c) Loading facilities for large tractor trailers (not including package delivery services such as Federal Express or UPS) shall be designed to not directly face residentially zoned property. In the event that tractor trailer loading facilities are located adjacent to residentially zoned property, the loading bay(s) and truck loading space(s) shall be fully screened from adjacent residentially zoned property with a building or a solid wall not less than 14 feet in height matching the primary building materials and colors.

# CITY OF RENO

## PUBLIC WORKS DESIGN MANUAL



REVISED DATE  
JANUARY, 2009

## INTRODUCTION

The purpose of this manual is to establish minimum requirements for design, plans, testing, inspection, and supporting documents. The requirements herein, unless otherwise noted, apply to public and private improvements. It makes reference to and is to be used in conjunction with the Standard Specifications for Public Works Construction and Standard Details for Public Works Construction, latest editions. Additional design publications referenced herein include, but are not limited to:

A Policy on Geometric Designs of Highways, American Association of State Highway and Transportation Officials (AASHTO)  
American National Standard Practice for Roadway Lighting, Illuminating Engineering Society of North America, July, 1983.  
American National Standards Institute (ANSI)  
Asphalt Institute Manual Series No. 1  
Flood Insurance Rate Map, Federal Emergency Management Agency  
Floodways Map, Federal Emergency Management Agency  
Guidelines for Development of New Bicycle Facilities, AASHTO  
Guidelines for Urban Major Street Design, Institute of Traffic Engineers (ITE)  
HEC-1, HEC-2, HEC-RAS, Army Corps of Engineers  
Manual on Uniform Traffic Control Devices (MUTCD), Federal Highway Administration  
Reno Municipal Code  
Technical Release No. 55, Urban Hydrology for Small Watersheds, Soil Conservation Service  
The Blue Book (A Reference Manual of Nevada Law Governing Design for the Construction Industry)  
Truckee Meadows Construction Site Best Management Practices Handbook (Truckee Meadows Regional Stormwater Quality Management Program), February 2003

The requirements herein apply to a Public Works Project, Subdivision, Special Use Permit, Site Plan Review, Parcel Map, Maps of Dedication, Zone Change, Annexation, excavation/encroachment permit or building permit.

This manual is intended to cover only standard situations encountered in design. Non-standard situations that arise which are not covered in this Manual are to be designed in accordance with accepted engineering practices, the Standard Specifications for Public Works Construction, Standard Details for Public Works Construction, shall contain supporting data, shall be subject to the approval in writing of the City Engineer, and shall not be authorized in any case for any purposes of mere convenience or economy.

Atypical situations may arise with respect to standards covered by this manual, and in

such cases, the City Engineer may authorize alternative standards, provided that any such alternative standards are the equivalent of the design standards and are in accordance with accepted engineering practices, provided that such alternatives shall not be authorized in any case for any purposes of mere convenience or economy, and provided further that such alternatives with all supporting data be submitted to the City Engineer in writing for his review and approval.

Additional information, explanation, calculation, details, non-standard parts approvals, warranties, instruction manuals, references or other design elements may be required at the discretion of the City Engineer.

The City does not assume maintenance responsibility for access, drainage facilities, sanitary sewer facilities, and their associated structures located outside the limits of dedicated street rights-of-way or public easements, or which are not constructed to City standards for public facilities.

Private facilities for access, drainage and sewerage located on private streets, lots or parcels are to be owned and maintained by the property owners.

All on-site private improvements are certified to the Community Development Department, Building Division, except as provided herein.

Users of this manual are cautioned that other policies or standards may apply. Examples include those provided by the Regional Transportation Commission; State of Nevada Department of Transportation; Washoe County; City of Reno, Fire Department; and City of Reno, Downtown Redevelopment District.

## CHAPTER II - STORM DRAINAGE

- 201 General
  - 201.1 Use of Chapter II
  - 201.2 Triggers for Drainage Report
  - 201.3 Relationship to Chapter on Storm Water Quality
  
- 202 Design Guidelines
  - 202.1 Hydrology
    - 202.1.1 General
    - 202.1.2 Design Storm Frequency
  - 202.2 Hydraulic Design
    - 202.2.1 General
    - 202.2.2 Site Design/Subdivisions
    - 202.2.3 Open Channels
    - 202.2.4 Storm Drain Systems
    - 202.2.5 Streets and Roads (surface drainage)
    - 202.2.6 Culverts and Bridges
    - 202.2.7 Detention/Retention
    - 202.2.8 Sediment and Stream Stability
    - 202.2.9 Additional Hydraulic Structures
  - 202.3 Major Drainageways
  - 202.4 Easements
  - 202.5 Access
  - 202.6 Irrigation or Water Supply Ditches
  - 202.7 Flood Hazard Areas
  - 202.8 Safety
  - 202.9 Other Agencies
  
- 203 Submittal Requirements
  - 203.1 Drainage Report

## **201 General**

### **201.1 Use of Chapter II**

Chapter II of the City of Reno Public Works Design Manual is intended to be used in conjunction with the Truckee Meadows Regional Drainage Manual (TMRDM).

The TMRDM (formerly known as the Washoe County Hydrologic Criteria and Drainage Design Manual) is the primary reference document for hydrologic criteria and drainage design for the City. The topics and criteria covered in Chapter II of the Public Works design manual are intended to:

1. address those topics not included in the TMRDM
2. provide alternate or more restrictive criteria as compared to the TMRDM
3. emphasize specific criteria from the TMRDM

The TMRDM shall be adhered to except for those cases in which alternative or more restrictive criteria are proposed in this chapter, or where directed by the City Engineer.

For the purposes of this chapter the terms “public facilities” and “City owned facilities” shall be interpreted to mean those facilities built by the City as public facilities, those facilities built by private interests and intended for dedication to the City, or those facilities built by any party other than the City which are reasonable candidates for dedication to the City, or for which it can be reasonably anticipated that the City will maintain at any point in the future.

### **201.2 Triggers for Drainage Report**

A drainage report shall be submitted for any of the following:

1. Permit relating to coverage of 10,000 or more sq. ft. of impervious surface within the property.
2. Where development is in a critical drainage area.
3. Grading permit which entails 20,000 sq. ft. or greater.
4. Subdivision Improvement Plans.
5. Where required by the City Engineer.

The drainage report shall be signed and stamped by a Nevada Licensed Civil Engineer in accordance with City standards unless requirement is waived by the City Engineer.

The drainage report shall be based on current zoning or Master Plan whichever produces the greater runoff.

### **201.3 Relationship to Chapter on Storm Water Quality**

This chapter contains criteria primarily directed toward the consideration of conveyance of stormwater flows and related facilities. The design engineer cannot, however, overlook storm water quality considerations and requirements during the design of conveyance facilities, as they are integrally related and will many times control or heavily influence the design of storm water conveyance facilities. The requirements and criteria relating to storm water quality (Chapter X) are intended to work in conjunction with the requirements presented in this chapter, and the requirements of this chapter are not intended to preclude any requirement or criteria of Chapter X.

## **202 Design Guidelines**

### **202.1 Hydrology**

#### **202.1.1 General**

NOAA Atlas 14 shall be used for rainfall in the City of Reno (see <http://nws.noaa.gov/ohd/hdsc/>). See the TMRDM for alternate methodology, where applicable.

The Rational Method may be used in computations for the rate of runoff for urban and small watersheds 100 acres or less. The SCS method, SCS TR-55 "Urban Hydrology for Small Watersheds", HEC-1/HEC-HMS, or the methods outlined in the TMRDM shall be used for larger watersheds.

The Rational Method:

The design flow for the Rational Method is expressed as:

$$Q = CiA,$$

where:

Q = peak rate of runoff, cubic feet per second

C = runoff coefficient

i = average rainfall intensity, inches per hour

A = watershed area, acres

The following Table 201 listing runoff coefficients based depending on future use, shall be used:

**TABLE 201 RUNOFF COEFFICIENTS "C"**

<u>Land Use Type</u>	<u>Runoff Coefficient "C"</u>
Rural .....	0.25-0.35
Single Family Residential .....	0.45-0.60
Multi-Residential.....	0.60-0.70
Neighborhood Commercial .....	0.85
Community Commercial .....	0.85
Tourist Commercial.....	0.85
Office.....	0.85
Manufacturing .....	0.85-0.90
Distribution and Warehousing.....	0.85-0.90
Public Facility.....	0.50-0.85
Pavement and Concrete Surfaces .....	0.90-0.95
Park.....	0.25
Open Space (0-5% grade - vegetated).....	0.20-0.30
Open Space (0-5% grade - no vegetation).....	0.30-0.40
Open Space..... (5-15% grade - vegetated or unvegetated)	0.40-0.50
Open Space..... (Over 15% grade - sparsely vegetated, rock or clay soils)	0.40-0.60

Weighted values of the runoff coefficient “C” may be required where land use is most accurately described as a mixture of the land uses listed above or where it is a mixture of impervious and pervious areas and not well represented by a single entry in the preceding list.

Sub-areas which include an LID feature will typically require special consideration and weighting of the runoff coefficient “C”. See Chapter X for specific guidance on post construction storm water quality design considerations.

Included below for reference is Table 202 from both the TMRDM and the Truckee Meadows Structural Controls Manual.

**TABLE 202 ADDITIONAL RUNOFF COEFFICIENTS  
"C" FOR REFERENCE**

Runoff coefficients for the Rational Method from the Washoe County Hydrologic Criteria and Drainage Design Manual (a.k.a., the TMRDM) and the City of Sparks (1998 and 1996, respectively), and as per the Truckee Meadows Structural Controls Design Manual.

Land Use or Surface Characteristics	Aver. % Impervious Area	Runoff Coefficients	
		5-Year (C <sub>5</sub> )	100-Year (C <sub>100</sub> )
<u>Business/Commercial:</u>			
Downtown Areas	85	.82	.85
Neighborhood Areas	70	.65	.80
<u>Residential:</u> (Average Lot Size)			
1/8 Acre or Less (Multi-Unit)	65	.60	.78
1/4 Acre	38	.50	.65
1/3 Acre	30	.45	.60
1/2 Acre	25	.40	.55
1 Acre	20	.35	.50
<u>Industrial:</u>	72	.68	.82
<u>Open Space:</u> (Lawns, Parks, Golf Courses)			
	5	.05	.30
<u>Undeveloped Areas:</u>			
Range	0	.20	.50
Forest	0	.05	.30
<u>Streets/Roads:</u>			
Paved	100	.88	.93
Gravel	20	.25	.50
<u>Drives/Walks:</u>	95	.87	.90
<u>Roofs:</u>	90	.85	.87

Notes:

- Composite runoff coefficients shown for Residential, Industrial, and Business/Commercial Areas assume irrigated grass landscaping for all previous areas. For development with landscaping other than irrigated grass, the designer must develop project specific composite runoff coefficients from the surface characteristics presented in this table.

Intensity-Duration-Frequency curves from NOAA Atlas 14 (at [http://hdsc.nws.noaa.gov/hdsc/pfds/sa/nv\\_pfds.html](http://hdsc.nws.noaa.gov/hdsc/pfds/sa/nv_pfds.html)) shall be used for determining the applicable intensity. The time of concentration is expressed as:

$$t_c = 10 \text{ or } \frac{L}{V \times 60}, \text{ whichever is greater}$$

where:

- $t_c$  = initial time of concentration at inlet, minutes
- $L$  = length from uppermost point of watershed inlet, feet
- $V$  = channel or overland velocity, feet per second

Given the time of concentration at a design point, the time of concentration at the next design point is determined by adding travel time, expressed as:

$$t = \frac{L}{V \times 60}$$

where:

- $t$  = travel time, minutes
- $L$  = length of channel or conduit between design points, feet
- $V$  = channel or conduit velocity, feet per second

Refer to Chapter X for additional hydrologic criteria relating to storm water quality.

### 202.1.2 Design Storm Frequency

For Streets and Roads see the TMRDM for requirements.

For developed sites, both onsite and offsite flows are to be provided for and channelized to City standards within dedicated easements, streets or public right-of-way to protect structures from flooding for events up to and including the 100-yr return frequency storm. Additionally, onsite and offsite flows for the 5-yr return frequency are to be contained within the storm drain, where less than 60 cfs. See section 2.2.4 for additional criteria for storm drain. A lesser return period may be acceptable for some limited cases such as where minor flows are present or for improvements in built-out areas, and will require prior approval by the City Engineer.

For onsite calculations, runoff from surface drainage of streets and roads shall be computed by the Rational Method.

See Chapter X for additional criteria on design storm frequencies.

See the TMRDM for special criteria relating to the Silver and Swan Lake (a.k.a. Lemmon Lake) basins.

## **202.2 Hydraulic Design**

### **202.2.1 General**

Discharge of stormwater runoff into a major drainage facility or natural water course shall not be allowed to increase the 100-yr historical peak flow in said facility, unless it can be demonstrated that any increase in peak flow will not adversely affect or cause damage to:

1. the facility itself, whether it be a natural or improved conveyance
2. any property along said drainage facility or water course now or in the future, based on existing zoning, master plan and elements thereof.

This shall be demonstrated to the City in the drainage report, and include consideration of runoff volumes, flow velocities, flow depths, timing of peaks, sediment and erosion.

Constructed public drainage facilities with design flows of 60 cubic feet per second or less shall be piped in accordance with City standards. Constructed drainage facilities with flows exceeding 60 cubic feet per second may be open channel conveyances, when approved by the City Engineer.

Drainage shall not be diverted from one major drainage basin to another without prior approval from the City Engineer and documentation demonstrating no adverse impact with consideration given to peak flows, flow duration, volume of flow, sediment, erosion, timing of peak flow or other factors.

### **202.2.2 Site Design/Subdivisions**

#### **202.2.2.1 Runoff Increases**

Development shall not increase peak runoff from a site for all storm events between the 5-yr and 100-yr return period unless it can be demonstrated that no adverse impacts will occur (including demonstration that any downstream storm drain system has the capacity to handle the 5-yr event). Paths of the 100-yr flows must be considered in the design and must not be diverted or obstructed, and must be evaluated to ensure they will not cause damage to existing facilities or infrastructure (public or private). Mitigation of increases in runoff peaks and volume where

downstream systems do not have the capacity to handle the increase, or where adverse impacts will otherwise occur shall be addressed though:

1. detention of flows
2. upgrading of existing downstream system
3. Low Impact Development
4. on-site retention/infiltration system

#### **202.2.2.2 Flow Paths**

Surface drainage from any developed area shall not cross any property line except by way of a natural watercourse, major drainage facility, an approved drainage system within a public storm drain easement, or a permanent surface drainage easement. Historic drainages will require new easements, even if no easement existed before.

Existing surface drainage from adjoining property shall be perpetuated through the development, or other means of disposal provided, acceptable to the City Engineer.

#### **202.2.2.3 Future Connections**

Storm drain facilities (and post construction storm water quality treatment controls) shall be extended with a subdivision or development to adjacent undeveloped properties for future extensions in accordance with approved drainage plans (or an approved post construction stormwater management plan), unless otherwise approved by the City Engineer.

#### **202.2.2.4 Curb, Gutter and Swales**

Reinforced concrete interceptor swales are to be provided along the top of retaining walls and cut slopes to intercept drainage. Discharge swales and wall drains into approved drainages. When required by the City Engineer, reinforced concrete swales shall be provided to intercept drainage from adjacent property.

All drainage from impermeable surfaces on retail, commercial, industrial or similarly developed sites shall be contained by Portland Cement concrete curb and gutter or longitudinal valley gutter to City standards, except where required for LID features as part of the post construction stormwater quality treatment approach.

Surface drainage swales collecting runoff from the area of 2 or more lots are to be addressed through either a paved swale in accordance with City standards, or an LID feature which addresses drainage concerns, and are to be maintained and perpetuated by the property owners. Paving is not required for common side lot swales serving only 2 adjacent lots.

Easements for rear lot drainage swales shall be established by a note on the official plat substantially as follows:

The rear 5.0 feet of Lots, shall be subject to a permanent private and reciprocal drainage swale easement.

-- When Appropriate Add --

Which easement shall be further reciprocal with all lots the rear lots lines of which abut such easement.

Standard lot line drainage swales are to be designed to carry the waters generated by a 100-yr frequency storm, with a maximum of 6 lots contributing run-off to the swale. Discharge from swales shall be conveyed to a public drainage facility. Should it be necessary to provide for drainage from more than 6 lots and/or to exceed the maximum horizontal or vertical alignment (as shown in standard detail), a modified design capable of conveying the run-off from the 100-yr storm may be submitted for review by the City Engineer.

#### **202.2.2.5 Edge Drains and Landscape Drains**

All perforated pipe used for landscape drains that connect to the public system must be enclosed around entire circumference (full envelope) in non-woven Geotextile filter fabric.

Edge drains located in streets, parkways, medians, etc. shall extend at least 12 inches below the street subgrade and consist of either a narrow trench backfilled with Class B or C drain rock or a synthetic edge drain product such as MiraDrain 5000 or approved equal. Drain rock should be separated from native soil backfill by a geotextile, such as Geotex 311 or equal. In non-cohesive soils, the fabric should also be placed on the upslope side, between the native soils and the drain rock/backfill.

See section 202.2.5 for special criteria on connections pertaining to approved drains for the benefit of stormwater quality treatment controls and LID features.

All LOMR related improvements must be completed with the associated portion of the project.

#### **202.2.3 Open Channels**

##### **202.2.3.1 Design Frequency**

All open channels shall be designed to carry the runoff generated by the 100-yr storm from fully developed conditions within the watershed, based on maximum density and in accordance with current zoning. This includes minor roadside channels/ditches and those found within subdivisions or other developed sites. A lesser return period may be acceptable to the City Engineer for some limited cases such as where minor flows

are present or for improvements in already built-out areas, and will require prior approval. In such cases the impacts of the 100-yr flows shall still be considered, and shall not be exacerbated or likely to cause damage.

### 202.2.3.2 Manning's n Values

Manning's Formula is to be used in computing capacities of all open channels with the following minimum values for roughness coefficient "n":

Open channels with gunite lining .....	0.019
Open channels with paved bottom.....	0.025
Earth channels (no rock or gravel) .....	0.030

The n value for other linings shall be determined per approved Engineers Manual based on size and placement of materials. See Truckee Meadows Structural Controls Manual for additional guidance on n values for shallow flow depths or for materials typical of LID features.

### 202.2.3.3 Lining

Lining for drainage channels shall conform to the following requirements:

- a. Design velocity of less than 6 fps - Channel lining of non-eroding, long life, low maintenance material as approved by the City Engineer. Side slopes 3:1 maximum unless otherwise approved by the City Engineer. For highly erosive soils, riprap may be required by the City Engineer, even for velocities less than 6 fps.
- b. Design velocity 6 to 15 fps - Channel lining of loose rock riprap sized for velocity. Side slopes 2:1 maximum. Other lining types may be allowed as approved.
- c. Design velocity greater than 15 fps - Channel lining of concrete or an engineered equivalent.

For criteria on riprap sizing, see the TMRDM.

For riprap lined channels, 1 ft min freeboard is required.

Any connecting or entering channels must be designed with consideration given to the lining or erosion control measures of the primary channel, and shall not cause damage, scour or erosion.

The use of grouted riprap is not allowed. Any exceptions must be approved by the City Engineer, and the installation must still conform to criteria in the TMRDM.

**202.2.3.4 Easements and Access**

Easements and access are also required along drainage ditches for the entire ditch length for general maintenance, vegetation maintenance and control, herbicide spraying, and Washoe County Vector Control. This includes features intended for post construction stormwater quality management

**202.2.4 Storm Drain Systems**

**202.2.4.1 Design Frequency**

Design the storm drain system to convey the five year storm including all downstream improvements and discharge to an existing adequate public storm drain system, major drainage facility or natural watercourse. Where by reason of terrain or other circumstances, the City Engineer determines that piping stormwater runoff is inappropriate or unnecessary, alternative approaches may be approved.

Minimum design velocity shall be 3 feet per second for storm drains and gutter pans to avoid deposition of sediment.

**202.2.4.2 Material**

Corrugated metal pipe (CMP) is not acceptable for storm drain systems for public improvements. All storm drain piping over 36" in diameter and located within the City right-of-way shall be a minimum of RCP Class III or the appropriate class when design requires a higher pipe support strength. Storm drain piping 36" and less shall be RCP III or solid wall plastic pipe with a minimum stiffness of 46 psi as specified in the Standard Specifications (Orange Book), except for culvert crossings. Individual catch basin leads may be constructed of unreinforced concrete pipe Class III or solid wall plastic pipe with minimum stiffness of 46 psi as specified in the Orange Book.

For open-jointed storm drain pipe placed below the water table, non-woven Geotextile filter fabric wrap shall be used with trench gravels, enclosed around entire circumference (full envelope).

**202.2.4.3 Manning's n Values**

Manning's formula is to be used in computing capacities of all closed conduits with the following minimum values for roughness coefficient "n":

PVC or ABS .....	0.013
Concrete Pipe .....	0.013

Corrugated Metal Pipe (100% paved).....	0.015
Corrugated Metal Pipe (paved invert).....	0.019
Corrugated Metal (plain).....	0.024

**202.2.4.4 Minimum Diameter**

Minimum pipe diameter for any public storm drain shall be 12 inch except for individual catch basin laterals not exceeding 80 feet in length which may be 10 inch minimum diameter.

**202.2.4.5 Discharge to Channel**

Where storm drain discharges to a major drainageway, the storm drain shall extend, as a minimum, to the water surface elevation of the 100-yr flood and be riprapped from the outlet of the storm drain to the bottom of the channel in the direction of flow.

**202.2.4.6 Headwalls**

Headwalls shall be placed on the inlet and outlet of all storm drain systems per applicable standards for culvert headwalls (see 2.2.6) unless due to hydraulic or geometric considerations a concrete end section is more appropriate (i.e., where a storm drain discharges to an open channel).

**202.2.4.7 Manholes**

Manholes shall be spaced at intervals not greater than 350 feet for pipes 21 inches dia. and smaller and at 600 feet maximum spacing for pipes 24 inches dia. and larger, unless otherwise approved by the City Engineer. Concrete collars shall be placed around all manholes, valves or other appurtenances within any right-of-way or easement. Such collar shall encircle all casting with a minimum width of one foot. Manhole collars shall conform to standard details; all others shall extend to a minimum depth of one foot.

Within storm drain manholes, the difference between the invert elevations of the primary inlet and outlet pipes shall create a minimum fall of one tenth (0.1) of a foot. When smaller secondary inlet pipes are to be added to the manhole, these pipes shall be positioned to optimize flow, where possible, and to prevent adverse flow conditions, as approved by the City Engineer.

**202.2.4.8 Catch Basins**

Flow through catch basins (i.e., catch basins which tie into each other) shall not be allowed in public systems.

#### **202.2.4.9 Maintenance and Access**

Maintenance access roads for storm drain structures (including inlets, outlets and manholes) sufficient for a backhoe to clear debris from trash racks during storm events must be provided.

#### **202.2.4.10 Abandoned Pipe**

Storm drain pipe that is abandoned must be solid grouted or removed.

#### **202.2.4.11 Laterals**

For ease of maintenance, laterals from catch basins must tie into trunk lines at a manhole and may not make a blind connection. See TMRDM for special criteria where trunk lines are greater than or equal to 48 inches. Where blind connections are specifically allowed for storm drain laterals, pipe inverts are to be at spring line or lower, preferably matching invert, and shall be positioned to provide maximum hydraulic efficiency. However, yard drains, landscaping drains, foundation drains and other similar local drain systems common to developed sites must tie directly into trunk line via a blind connection, and are not allowed to connect to manholes or catch basins. This criterion for local drain systems accomplishes the following:

1. discourages private interests from entering the public storm drain system for maintenance
2. promotes orderly placement of drain lines, typically perpendicular to trunk line and front lot lines
3. encourages consolidation of multiple drains from developed site into single conduit before connection to public system, thereby reducing utility clutter

Due to the special nature of LID features, especially in retrofit situations, where it is not feasible or practical to tie into the storm drain main, all City approved drains for the benefit of stormwater quality treatment controls (including edge drains where appropriate) may tie directly to catch basins and manholes with approval of the City Engineer.

#### **202.2.4.12 Cover**

Depth of cover on pipes shall be measured from bottom of A.C. to top of bells per the City of Reno Supplemental Standard Drawings.

### **202.2.5 Streets and Roads (surface drainage)**

#### **202.2.5.1 Sump Inlets**

Except for where design approach varies due to LID features, catch basins shall be installed at low points of vertical curves, at all major street intersections, and at sufficient intervals to intercept the peak flow for the 5-yr storm runoff such that flows

will not interfere with traffic or flood adjoining property. Alternate design approaches which direct storm water quality flows to into an LID feature must still intercept and divert flows out of street section, and be no less effective or reliable than an appropriately designed catch basin for all events up to the 100 year event.

For all sump inlets in a street section, size the inlet and connecting pipe for the 100-yr event, or provide a paved overland concrete swale within a corresponding drainage easement (where necessary) to convey storm runoff in excess of the inlet or storm drain capacity for flows up to the 100-yr event.

Where practicable locate inlets on grade (not in a sump) and design site to eliminate or minimize the number of inlets in a sump condition.

#### **202.2.5.2 Allowable Spread**

In no instance shall the flow of water from the 5-yr storm extend more than halfway into the travel lane adjacent the curb. Streets without parking lanes will require more frequent inlet locations. At intersections, catch basins shall be located behind the curb returns (not on the radius).

#### **202.2.5.3 General**

See section 202.2.2 for applicable requirements for edge drains in streets and medians.

Reinforced concrete valley gutters for public improvements may be placed at street intersections only when approved by the City Engineer.

#### **202.2.6 Culverts and Bridges**

##### **202.2.6.1 Design Frequency**

All culverts shall be designed to convey flows from the 100-yr event, based on fully developed conditions within the upstream watershed. This applies to roadway culverts, approach culverts, and culverts within subdivisions or other developed private sites. A lesser return period may be acceptable to the City Engineer for some limited cases such as where minor flows are present or for improvements in already built-out areas, and will require prior approval by the City Engineer. In such cases the impacts of the 100-yr flows must still be considered, and must not be exacerbated or likely to cause damage.

##### **202.2.6.2 Minimum Size**

For public improvements, the minimum culvert size shall be 18 inches in diameter for round pipe or shall have a minimum flow area of 2.2 square feet for other pipe shapes.

### **202.2.6.3 Material**

Corrugated metal pipe (CMP) is not allowed for public improvements. CMP may be approved for retrofit projects to match existing systems with the approval of the City Engineer.

### **202.2.6.4 Headwalls**

Headwalls or concrete end sections are required on all public culverts (this includes residential driveway culverts). All headwalls shall be designed with consideration given to skew angle of flows with respect to the culvert (The Nevada Department of Transportation standard culvert headwalls are acceptable and accommodate various skew angles). The City Engineer may require additional riprap armoring for any headwalls where scour or erosion is a concern, especially due to the angle of attack of any approach channel or ditch. For pipes up to and including 72 inches in diameter: the design, size, and material used shall comply in all cases with City standards. Headwalls for pipes exceeding 72 inches require special design as approved by the City Engineer.

### **202.2.6.5 Retrofit Criteria**

New developments are required to utilize storm drainage in place of roadside ditches. For those areas where retrofit of drainage systems is a factor, driveway culverts for single family residences shall be sized for 100-yr flows, or shall be sized for the equivalent roadside ditch flow area and be a minimum of 12 inches in diameter. Where headwalls are used for residential driveway culverts 18 inches in diameter and smaller, the following factors should be considered:

1. environment which is friendly to the residential user
2. aesthetics
3. protecting the culvert from damage due to anticipated residential wheel traffic
4. protecting the culvert from equipment during removal of sediment and debris
5. hydraulic efficiency

For such culverts, alternate headwall designs (i.e., smaller headwalls) which address these design concerns are acceptable and encouraged.

### **202.2.7 Detention/Retention**

Detention of 5- to 100-yr storm(s) is required based on limiting conditions downstream, and is many times the primary option for the mitigation of increases to peak runoff due to development.

See Chapter X for additional requirements pertaining to detention and retention

basins. The size of required basins may be reduced through the use of LID features, with appropriate consideration given to effectiveness of LID feature for longer return periods.

Infiltration systems shall require a percolation test as basis of design. The operation and maintenance of such a system is the responsibility of the property owner.

Provide for an emergency spillway which will not cause a direct impact to neighboring sites. The TMRDM provides criteria for the design and sizing of spillways.

Where required, provide a secondary outlet (in addition to the emergency spillway) based on the following criteria:

1. must be a piped system
2. secondary outlet elevation must be above the primary outlet
3. secondary outlet must be sized assuming that primary outlet is completely plugged
4. secondary outlet may tie into the conduit used for the primary outlet; its purpose is to provide an alternate outlet in case the primary outlet is plugged
5. secondary outlet must utilize a trash rack or beehive style grate

### **202.2.8 Sediment and Stream Stability**

See TMRDM.

### **202.2.9 Additional Hydraulic Structures**

Trash racks shall be provided at the upper end of all storm drain as approved by the City Engineer.

Do not place access prevention grate at outlet of drainage structures.

### **202.3 Major Drainageways**

Criteria relating to Major Drainageways are specified in Reno Municipal Code (RMC) 18.12. Major Drainageways may be either natural or improved systems, including both perennial streams and intermittent drainages meeting the applicable criteria. Development of property shall not adversely affect any major drainageway. Natural facilities shall remain in as near a natural state as is practicable with any modification proposed, including any erosion mitigation measures, addressed in the drainage report and drainage plan.

Embankment shall not be placed within the 100-yr floodplain of a major drainage facility. For approved exceptions, the embankment shall be faced with

appropriately sized riprap with freeboard required as for open channels.

The protection of drainage ways in the City of Reno is important to the public health, safety, and welfare and their protection implements the city's mandated policies to preserve major drainage ways as open and recreational space and to save and improve these public resource areas for future generations.

#### **202.4 Easements**

Storm runoff generated within the boundaries of a subdivision or development which discharges from a public drain system onto and across private property requires that a permanent easement for access and maintenance be granted the City Engineer from the subdivision or development boundary to the point of discharge into an existing public storm drain system, major drainage facility or natural water course. Improvements to City standards will be required to assure access and proper maintenance within said easement.

Easements with improved vehicular access in accordance with City standards shall be provided to publicly owned storm drain manholes, storm drain inlets and outlets, channels, storm drain ponds and to associated structures not located within an improved street section.

Easements for access to and maintenance of the 100-yr floodplain associated with a major drainage facility or natural water course are to be provided to the City. Improved vehicular access in accordance with City standards shall be provided when determined necessary by the City Engineer.

Consideration shall be given to appropriate maintenance operations and equipment when sizing easements for public improvements and shall be a minimum width of 15 feet. The final easement width shall also consider pipe width, required trench clearance, and excavated trench side slopes (not less than 1:1 horizontal to vertical, from top of pipe), unless approved by the City Engineer.

See Section 202.2.2 for requirements for easement requirements pertaining to site design and subdivisions.

#### **202.5 Access**

Where required, access for maintenance of facilities shall consist of a 15 foot easement with a 12' access road. The required surface treatment of the access road will be based on many considerations, including permeability, anticipated vehicle type and frequency, potential for erosion, slopes of adjacent terrain, priority to City, and anticipated future maintenance requirements, and is to be determined by the City. Where required adjacent a channel, the access road shall be at an elevation higher than the 100-yr water surface elevation in the channel.

For large open channels and those facilities which in the opinion of the City may require emergency vehicle access, a 12' clear lane shall be provided for emergency vehicles at all times.

For channels less than 30 feet in top width, one maintenance access shall be provided as part of the channel improvements. For channels greater than 30 feet in top width, the maintenance road shall be located at the bottom of the channel or on both sides at the channel top. Deviations from this are subject to approval by the City Engineer. Access to the bottom of the channel for maintenance shall be provided at approximately every ¼ mile.

Easements for access shall be dedicated "For Public Use" and shall provide for access by other public entities.

### **202.6 Irrigation or Water Supply Ditches**

Irrigation flows and public storm drain flows shall be conveyed by separate systems, unless specifically approved by ditch companies. All plans adjacent to or containing an irrigation or water supply ditch shall require the signature of the ditch company on the face of the plans.

No public storm drainage runoff shall be allowed to flow or discharge into any irrigation or water supply ditch. Private storm drainage runoff shall be allowed to flow or discharge into an irrigation or water supply ditch only with the approval of the ditch or utility company. Where allowed, discharge of private storm drain flows into an irrigation or water supply ditch are not to be a contributing factor insofar as increasing the peak flow or total volume of water for a 24-hour, 5-yr frequency storm in said facility above existing conditions.

All approved stormwater discharges to a natural waterway, irrigation ditch or water supply ditch must show that source controls have been applied to the maximum extent practicable. See chapter on Post Construction Stormwater Quality Management for additional requirements.

Where irrigation or water supply ditches are located within or adjacent to a subdivision/development, improvements and access as required for the operation and maintenance of the ditch shall be provided to the ditch company's approval. Any improvements within the ditch company's easements are subject to the ditch company's approval.

Any irrigation or water supply ditch adjacent to residential units is to be fenced with 54" fencing, approved by the City Engineer, to safeguard the general public [RMC 18.12.604].

## **202.7 Flood Hazard Areas**

Development within areas shown on the Flood Insurance Rate Map (FIRM) shall comply with Chapter 18.12 of the Reno Municipal Code (RMC). The RMC regulates development in which any portion of a structure or facility is within a FEMA regulated Flood Hazard Area. If a structure or facility lies within two or more Flood Hazard Areas, the most restrictive shall apply. Flood Zone regulations shall also apply to any portion of a parcel within a FEMA regulated Flood Hazard Area for which grading or other improvements are proposed.

Construction shall meet building requirements for the Truckee River Flood Plain Storage Zone 1: Critical Flood Pool per RMC 18.12.605.

## **202.8 Safety**

When the flows, velocity, or side slope as determined by the Drainage Report indicate a potential safety issue, fencing shall be provided.

## **202.9 Other Agencies**

Any work which requires fill be placed within the "waters of the State of Nevada" shall require a permit from the State Department of Environmental Protection prior to beginning construction. The City of Reno shall receive a copy of the State permit prior to issuance of a City permit.

Prior to issuance of any City permit for any facility encroaching on state right-of-way, and for disposal of any drainage onto state right-of-way, the approved NDOT encroachment permit shall be furnished to the City.

# **203 Submittal Requirements**

## **203.1 Drainage Report**

The following standards apply to the Drainage Report (public and private). The report is required to identify problems and present solutions with engineering documentation. Where appropriate, tabularized data on maps is preferred to lengthy written descriptions.

1. Title Page:
  - a. Project name.
  - b. Preparer's name, firm, date.

- c. Professional engineer's seal of preparer and signature.
2. Introduction:
- a. Site location:
    - (1) Street location, assessor's parcel number(s), and section reference.
    - (2) Adjacent developments.
  - b. Site description:
    - (1) Topography, ground cover, etc.
    - (2) Existing drainage facilities, major drainage facilities, flood hazard areas, irrigation ditches, other site conditions that must be considered.
  - c. Proposed project description.
  - d. Other previous studies relevant to site.
3. Historic drainage system (discuss the following):
- a. Major basins and offsite contributions:
    - (1) Relationship to major drainage facilities.
    - (2) Major basin drainage characteristics (topography, runoff, cover, use, erosion, etc.).
  - b. Sub-basin and site drainage (1 and 2 may be tabulated on map):
    - (1) Minor (5-yr) and major (100-yr) storm flows for each sub-basin affecting the site.
    - (2) Existing drainage patterns: channelized or overland flow, point of discharge, etc.
    - (3) Effect of historic flows on adjacent properties.
4. Proposed (developed) drainage system (discuss each of the following):
- a. Criteria:

- (1) Size of major basins, tributary sub-basins, and other offsite contributions.
  - (2) Hydrologic method to be used for analysis (Rational, SCS, etc.).
  - (3) Design storm intensities (minor 5-yr, major 100-yr) or as required by the City Engineer.
- b. Runoff and other contributions:
- (1) Historic storm flow rates and paths.
  - (2) Developed storm flow rates and paths for minor and major storms.
  - (3) Contributions added from open joined system.
  - (4) Demonstrate that flows are routed to a public system with adequate capacity.
- c. Piping:
- (1) Demonstrate the capacity of the storm drain system, including all downstream improvements.
  - (2) Verify storm flows from inlets to ultimate outlets of the drainage system.
- d. Detention system including
- (1) Volume required and provided for zero increase in peak flows.
  - (2) Release rates and method of release.
  - (3) Passage of storms exceeding the 5-yr up to the 100-yr.
  - (4) Engineer to provide detailed description of downstream constraints (or none) and design calculations on how to mitigate the problem.
  - (5) Need for detention shall be clearly identified in the preliminary or schematic report and the necessary detention area shall be identified on preliminary plans.
- e. Streets (This information may be shown on the plans.):

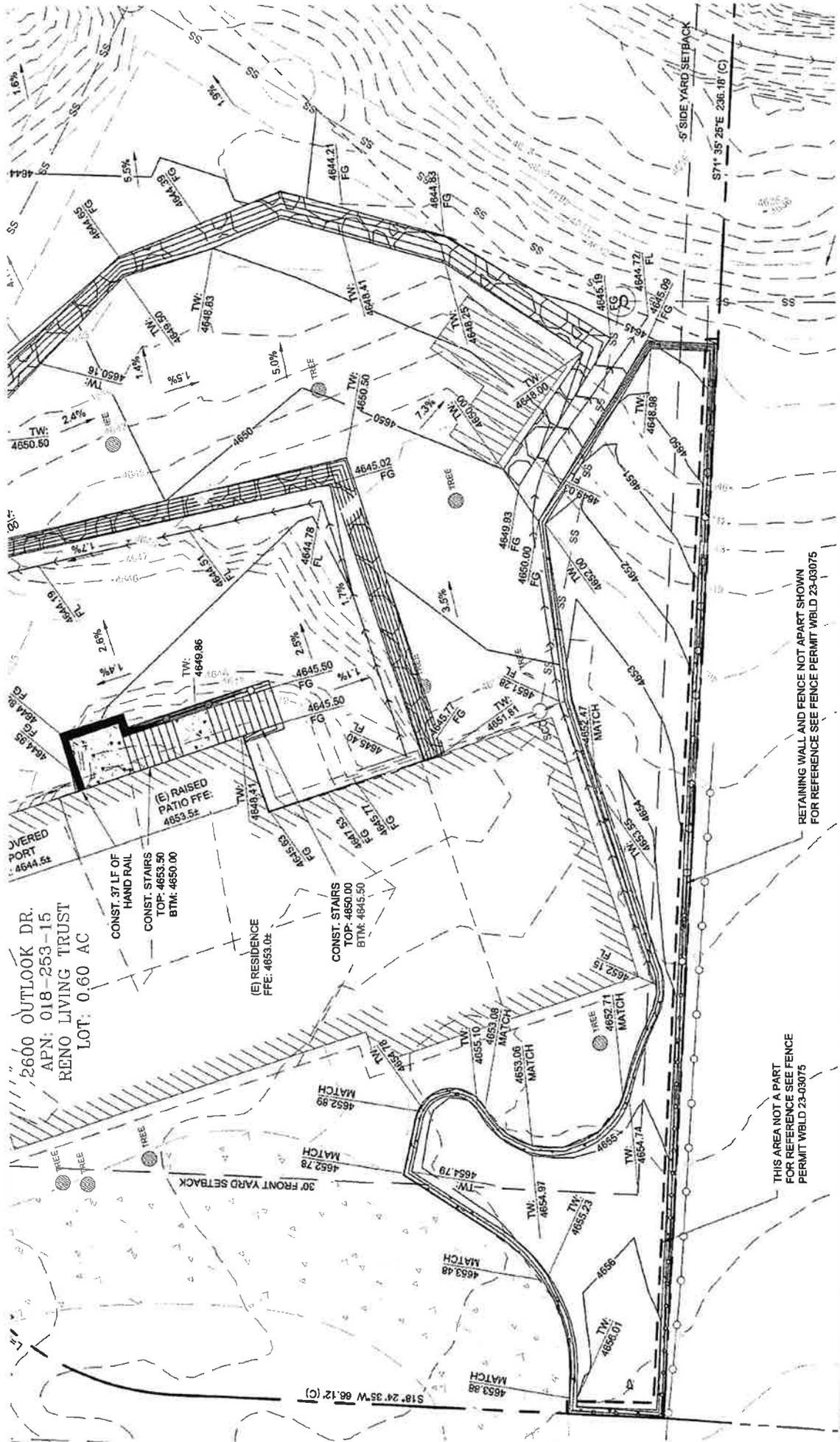
- (1) Depth and velocity of flow for major and minor storms. Demonstrate that a 12' clear lane exists for emergency vehicles at all times.
    - (2) Drainage system.
  - f. Open channel flow (This information may be shown on the plans.):
    - (1) Type.
    - (2) Depth and velocity.
    - (3) Freeboard.
    - (4) HEC-RAS analysis when required by the City Engineer.
  - g. Storm drains and culverts (Show all data on plans.):
- 5. Areas within flood hazard zone when applicable:
  - a. Impacts.
  - b. Protection.
  - c. Compliance with Federal Emergency Management Administration (FEMA) requirements, RMC 18.12 "Flood Hazard Areas", and critical flood zones. Show existing and proposed CLOMR and LOMR information, and show status of submittal and review process.
- 6. Conclusions - Discuss impact of improvements:
  - a. Benefits.
  - b. Adverse affects with solutions for mitigation of impacts.
- 7. Appendices:
  - a. Hydrologic and hydraulic computations:
    - (1) List and explain basic assumptions and input factors used:
      - (a) Tabularized and/or discussed as necessary.
      - (b) Indicate any sensitivity analysis performed.

- (c) Include source tables and references for parameters, such as soils groups, SCS curve numbers, C values, n values, etc.
  - (2) Historic runoff:
    - (a) Off-site.
    - (b) On-site.
  - (3) Developed runoff:
    - (a) Off-site.
    - (b) On-site.
  - (4) Detention for up to the 100-yr storm.
  - (5) Hydraulic computations:
    - (a) Hydraulic grade line (HGL) minor storm.
    - (b) Hydraulic grade line (HGL) major storm.
    - (c) Inlet/outlet calculations.
  - (6) Rip-rap sizing.
- b. Drainage plan:
- (1) Site drainage plan:
    - (a) Show the existing and proposed contours at least 100 feet beyond property line.
    - (b) The site drainage plan may be at the same scale as the grading plan but must meet legibility requirements for scanned documents. Show all sub-drainage areas per catch basin or channel and tabulate existing and proposed drainage showing length, assumed velocity and time of concentration on various runs of grass, gutters, etc., cumulative time of concentration, average rainfall intensity, area, runoff coefficient (weighted if necessary), and peak flows for 5- and 100-yr storms.

- (c) All inlets and manholes shall be labeled to correspond to tabular numbering system used in drainage report. Pipe sizes, grades, velocities, peak flows and hydraulic grade lines shall be shown for all parts of the system in a tabular form on the plans.
  - (d) Both location plan (overall drainage) and subdrainage plan shall be signed and sealed by a Nevada Registered Civil Engineer and shall be included in the construction plans for the subdivision/development.
  - (e) On grading plans show peak flows for 5- and 100-yr storms at inlets and other sub-basin points of concentration, at discharge points and in channels. Show peak flows entering and leaving the site; trace path leaving site to nearest major drainage facility without adverse impact to downstream owners.
  - (f) On plan and profile sheets, show peak flows for 5- and 100-yr storms at all inlets and in pipes as per above, and in pipes show slope, velocity, and capacity, and hydraulic grade line if surcharged.
- (3) Bench marks - To be shown on plans with description and elevation.
  - (4) Existing and proposed property lines.
  - (5) Existing and proposed drainage easements.
  - (6) Street names, grades, widths and rights-of-way or easements.
  - (7) Routing and accumulative flows at the upstream and downstream ends of the site and at various critical points on-site for both minor and major runoff. Inflow and outflow for both storms for all sub basins.
  - (8) Street cross sections showing 100-yr flood levels. Show 12' emergency vehicle clear lane.
  - (9) Existing and proposed major drainage facilities.
  - (10) Open channel flow in major channels shall be provided with the following information on plans:

- (a) Channel and hydraulic grade line (HGL) profiles.
  - (b) Cross sections and required rights-of-way at 100 foot intervals.
  - (c) Location and size of all existing and proposed structures.
  - (d) Channel section and lining details.
  - (e) Freeboard for 100-yr flows.
  - (f) Channel capacity and storm flows, 5- and 100-yr flows and velocities.
- (11) Storm sewers (show on plans):
- (a) Hydraulic grade line (HGL) profiles.
  - (b) Location and size of all existing and proposed structures.
  - (c) Proposed materials.
  - (d) Pertinent elevations and slopes.
  - (e) Pipe capacity and 5- and 100-yr flows and velocities.





**PAYMENT DATE**  
02/05/2024

**COLLECTION STATION**  
7933 - Front Desk 2

**RECEIVED FROM**  
APPEAL FEE -MICHAEL  
POWELL

**DESCRIPTION**  
APPEAL TO COUNCIL BLD23-03075-05279

**City of Reno**  
1 East First Street  
Reno, NV 89501

**BATCH NO.**  
2024-00003056

**RECEIPT NO.**  
2024-00164831

**CASHIER**  
Roman, Lorena

**PAID**  
**FEB 05 2024**  
**CITY OF RENO**

PAYMENT CODE	RECEIPT DESCRIPTION	TRANSACTION AMOUNT																
6901	Copies/Miscellaneous 00100-0000-5780-1099 Other income \$100.00	\$100.00																
<table border="0" style="width: 100%;"> <tr><td>Total Cash</td><td style="text-align: right;">\$0.00</td></tr> <tr><td>Total Check</td><td style="text-align: right;">\$0.00</td></tr> <tr><td>Total Charge</td><td style="text-align: right;">\$100.00</td></tr> <tr><td>Total Wire</td><td style="text-align: right;">\$0.00</td></tr> <tr><td>Total Other</td><td style="text-align: right;">\$0.00</td></tr> <tr><td>Total Remitted</td><td style="text-align: right;">\$100.00</td></tr> <tr><td>Change</td><td style="text-align: right;">\$0.00</td></tr> <tr><td>Total Received</td><td style="text-align: right;">\$100.00</td></tr> </table>		Total Cash	\$0.00	Total Check	\$0.00	Total Charge	\$100.00	Total Wire	\$0.00	Total Other	\$0.00	Total Remitted	\$100.00	Change	\$0.00	Total Received	\$100.00	
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<b>Customer Copy</b>																		