

RESOLUTION NO. 8144

**RESOLUTION APPROVING THE REVISED CITY OF RENO
PUBLIC WORKS DESIGN MANUAL
CHAPTER VI – QUALITY ASSURANCE PROGRAM**

WHEREAS, the City of Reno desires to revise the Public Works Design Manual, Chapter VI – Quality Assurance Program;

NOW, THEREFORE, be it resolved by the City Council of the City of Reno, Nevada, that the Public Works Design Manual, Chapter VI – Quality Assurance Program be revised as set forth in Exhibit “A”, which is on deposit in the office of the City Clerk;

NOW, THEREFORE, be it resolved that the Public Works Design Manual, Chapter VI – Quality Assurance Program Revision (Exhibit “A”), is hereby approved.

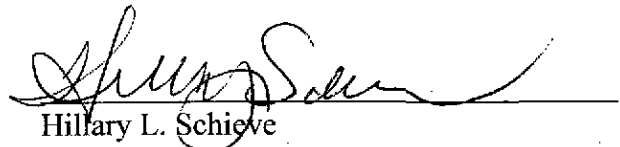
Upon motion of Council Member McKenzie, seconded by Council Member Delgado, the forgoing resolution was adopted this 27th day of January, 2016, by the following vote of the Council:

AYES: McKenzie, Delgado, Bobzien, Brekhuis, Duerr, Jardon, Schieve

NAYS: None

ABSTAIN: None ABSENT: None

APPROVED this 27th day of January, 2016.


Hillary L. Schieve
Mayor

ATTEST:

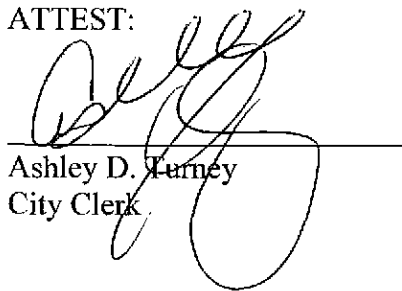

Ashley D. Turney
City Clerk



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CHAPTER VI QUALITY ASSURANCE PROGRAM (QAP)

SECTION 1 - General:

It is the intent of this chapter to set forth the requirements and responsibilities of those parties involved in the Quality Assurance Program (QAP) which includes the inspection, testing, verification, and acceptance of public improvements or other new related construction to provide consistent and satisfactory quality of such improvements. Public improvements are those that are or will be owned or maintained by the City of Reno or another public agency.

All new construction shall have an Engineer of Record (EOR), when required by the City Engineer or his designated representative. The program shall consist of a Quality Assurance Inspector (QAI), employed by the City and serving as the representative of the City Engineer, and the EOR. The EOR shall be retained by the owner, shall report to the QAI, and serve as the City's inspection, testing, and construction verification representative during the construction of the public improvements. The EOR shall be selected from the City's qualified EOR list. The contractor shall not retain the EOR, unless he is also the owner.

The EOR shall be responsible for all inspection, testing and verification of the constructed improvements for compliance with the permitted improvement plans of record and City Standards. The term "City Standards" for the purposes of this chapter is defined as the City of Reno Public Works Design Manual, the City of Reno Construction Standard Details, Reno Municipal Code, and the Standard Specifications for Public Works Construction (Orange Book).

All new construction requiring an EOR shall have a qualified testing firm, or testing capabilities, responsible directly to the EOR and reporting to the EOR. The EOR is not responsible for means, methods, techniques, sequences or procedures of construction nor safety of the construction site.

The QAP elements contained herein shall apply to:

1. All public improvements in subdivisions, parcel maps, maps of dedication, records of survey, and easements related to subdivision of land.
2. Other major public improvements as required by the City Engineer.

All private subdivision and related street, sanitary sewer and storm drain improvements shall comply with all of the EOR requirements contained herein without the QAI, and without acceptance for maintenance by the City. The EOR shall verify to the City compliance with City standards prior to issuance by the City of any temporary or permanent certificate of occupancy (except for model homes). The City does not require security for completion of private improvements, and cannot assure completion of same, nor can it assure the quality

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of such private improvements. The private maintenance entity may at its discretion enforce the one-year warranty.

SECTION 2 - Responsibilities:

1. Owner/Developer:
 - a. Shall retain the services of an EOR.
 - b. Shall retain the services of a qualified testing firm, if not coincidental with the EOR, which shall be responsible to the EOR and report to the EOR.
 - c. Shall select a qualified EOR from the City's qualified EOR list.
 - d. Shall be responsible for all costs associated to the EOR, inspectors, testing services, or verification of the constructed improvements as to compliance with the improvements plan of record and with City Standards as previously identified.
 - e. Shall retain the services of a contractor and notify said contractor of the requirements of this chapter.
 - f. Shall be responsible to the City for the adequacy of completed work covered under this chapter. Any defective material, equipment, or workmanship, or any unsatisfactory work which may be discovered before final acceptance, or within 1 year thereafter, shall be corrected immediately on the requirement of the EOR or City Engineer, without extra charge, notwithstanding that it may have not have been identified in previous inspections. Inspection of the work shall not relieve the owner from any obligation to perform sound and reliable work.
 - g. Shall designate a representative with authority to act on behalf of the owner for all work performed.
 - h. The owner acknowledges the need for continuing involvement of the firms or persons responsible for the preparation of the approved project soils report and the improvement plans of record during construction. In the event the EOR is different from those responsible for developing the approved project soils report and improvement plans of record, the owner agrees to be financially responsible for services provided by the said firms or persons as requested by the EOR.

2. Engineer of Record (EOR):

The EOR shall be responsible for the following:

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- a. Shall initiate a pre-construction conference for construction of improvements at least one week in advance of initial construction. Representatives of the owner, contractor, QAI, EOR and testing firm shall attend. No permit shall be issued prior to said pre-construction meeting.
- b. Shall submit for review, prior to initiation of the preconstruction conference, any proposed changes to the qualifications of the approved testing firm or the field inspection and testing technician personnel which were presented during the Statement of Qualifications process.
- c. Shall provide a written summary of the pre-construction conference to the owner, contractor and the QAI. The preconstruction checklist will be submitted prior to any permit being issued.
- d. Shall notify the QAI of the date and hour that work on any of the following items is expected to begin. Notification shall be given at least 24 hours in advance or as otherwise provided in City standards. If conditions develop that delay the start of work, the EOR shall notify the QAI of the delay, at least 2 hours before the work is to begin:
 - (1) Grading, excavation, and fill operations within public right-of-way.
 - (2) Installation of sewer lines, drainage lines or appurtenances.
 - (3) Backfilling of sewer lines, storm drain lines or appurtenances.
 - (4) Placing of reinforcing steel, forms and falsework for concrete structures.
 - (5) Placing the concrete for curbs, gutters, sidewalks, alleys, valley gutters, headwalls, or structures.
 - (6) Placing of any type of base course or courses.
 - (7) Tacking bituminous or concrete surfaces.
 - (8) Placing asphalt concrete or Portland cement concrete pavement.
 - (9) Sealing asphalt concrete or Portland cement concrete pavement.
 - (10) City owned landscaping and irrigation.
- e. If in the event a traffic signal is to be installed as a part of the project, the traffic signal loop detector locations shall be laid out in the field by the contractor per the design plans. After the loop locations are identified,

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EOR shall notify QAI, then City of Reno Traffic Signal Maintenance staff, to verify locations. Before new traffic signal installations are accepted by the City, the EOR shall provide the following:

- (1) A complete inspection of the signal installation by experienced personnel or design traffic engineer.
- (2) Signal phasing and timing patterns.
- (3) Proof of completion by the Engineer of Record prior to signal turn-on.
- (4) A copy of the building permit for the electrical service with a sign off by the City's Building and Safety Division.
- (5) Copies of non-standard parts approvals, warranties, instruction manuals, etc.

The signal will be turned on only after City of Reno signal maintenance staff have made a final walk-thru and have verified that the signal installation is complete. When the construction of new improvements disturbs existing City of Reno facilities, said facilities shall be relocated by the developer to current standard detail locations.

- f. Shall perform inspections for encroachment and excavation permits.
- g. Shall make inspection of workmanship and materials in accordance with this chapter. No work or materials will be accepted without such inspection. The EOR will make every reasonable effort to perform inspection and testing services in a manner which will accommodate the construction schedule.
- h. Shall provide to the Quality Assurance Inspector (QAI), on a bi-weekly basis, copies of the daily inspection/testing reports for the previous 2 weeks which document that adequate testing and inspection were performed in compliance with City Standards. Not required for private improvements -- see Section 1.
- i. Shall immediately notify the QAI in writing of any proposed changes from the improvement drawings of record. Should the QAI determine that the proposed change is significant in nature, such change shall require prior approval by the QAI. The City will not be liable for any delays caused by the review and approval of such changes.

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- j. Shall arrange to confer and coordinate with the firms or persons responsible for the preparation of the approved project soils report and the improvement plans of record throughout the construction of the project to evaluate compliance with the requirements of this chapter. In the event that the firms or persons responsible for the preparation of the approved project soils report or drawings of record are not available for consultation, the EOR shall notify the QAI of such prior to commencement of construction. In this event, the EOR and the QAI shall agree to an alternative arrangement for providing the necessary soils report and improvement plans of record interpretations prior to commencement of construction.
- k. Shall, notify in writing the owner, contractor and the QAI of any noted materials or workmanship that has been determined to be defective or unacceptable by the EOR or design engineer. Defective materials or workmanship shall be defined as, "not meeting City Standards and not satisfactorily corrected by the contractor within one week of verbal or written notification to the contractor. The verbal or written notification shall be supported by field reports and/or test results.
- l. At the request of the QAI, shall provide an Engineering Evaluation of materials or workmanship not meeting written City Standards. It is the responsibility of the QAI to accept or reject any such deviation. Any acceptance of such material or workmanship shall be supported on sound engineering practices and/or design. Appropriate documentation and references shall be cited.
- m. Prior to City acceptance of improvements shall submit final information conforming with the following sanitary sewer lateral identification requirements:

Survey information on any new sewer service lateral installed or an existing service lateral replaced shall be submitted to the City. Standard survey equipment or a global positioning device (GPS) shall be used to collect the coordinate information. The accuracy of the coordinate points shall be 12-inches or less in any horizontal direction. The coordinates collected shall be based on North American Datum of 1983 (NAD83 Nevada State Planes, West Zone, US Foot) Coordinate System. The combined mapping factor in Reno for West Zone coordinate conversion from grid to ground is 1.000197939. All coordinate information shall be submitted at ground. The coordinate information shall be provided as follows.

- 1. Provide "X, Y & Z" coordinate points identifying the service lateral at the point of connection to City sewer main.

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2. Provide "X, Y & Z" coordinate *points* identifying the service lateral at the top of the service lateral cleanout where it exits the public right-of-way or easement.
 3. Provide "X, Y & Z" coordinate points of the two nearest sewer manhole structures on the same sewer main as the service lateral. One structure shall be the nearest upstream structure from the service lateral, other shall be the nearest downstream structure. The GPS survey point shall be taken at the center of the structure manhole cover.
 4. Coordinate data shall be submitted to the City in digital and hardcopy format. The digital file shall be either in Microsoft Excel or a Comma-Separated Value (CSV) file format. A hardcopy of the digital file(s) shall be submitted with the digital file(s) that have been certified by the responsible party that the information is accurate and true.
- n. Shall, upon completion of the construction of improvements, provide the City with a letter of verification regarding the adequacy of the improvements. The letter must include the following: construction, inspection, and testing were performed in compliance with this chapter, improvement plans of record and City Standards:
1. A compact disc containing the drawings of record in pdf format, at a resolution of 300 dpi or greater, reproduced from the original drawings that have been wet stamped and sealed by a Nevada licensed civil engineer per requirements in Chapter V. Section 4 of this Manual. Drawings shall depict any changes from the approved drawings of record (per requirements in Chapter V, Sections 3 and 4) or a statement that no changes were made;
 2. A complete packet of daily field reports, laboratory test results, summary of punch list items and any correspondence related to the requirements of this Chapter..
- The final completion and acceptance of all such improvements, including recommendations to release and return any security, shall be subject to the approval of the City Engineer.
- o. Shall sign and wet-stamp, or cause to be signed and wet-stamped by a Nevada licensed engineer, all drawings of record, all reports and test data as required by Nevada Revised Statutes Chapter 625. All such documents shall be forwarded to the City, owner and the contractor. Unsatisfactory conditions shall be identified on the cover sheet of any report package.

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Permit numbers shall be clearly identified on any dailies, reports, or submittals to the QAI.

- p. Any oversight on the part of the EOR to condemn or reject materials or work shall not be construed to imply an acceptance of the material or work. The failure to reject any defective work or materials shall not in any way prevent later rejection when such defect discovered and such failure shall not obligate the EOR or City of no to make final acceptance per City Standards.
3. The City Engineer or his designated Quality Assurance Inspector (QAI):
- a. Shall assign a primary contact to the EOR who shall serve as the City's representative during construction of public improvements. This primary contact shall be known as the City Quality Assurance Inspector (QAI). The QAI, with the City Engineer's approval, shall have the authority to issue a stop work order for non-compliance with the QAP.
 - b. Shall develop a list of firms qualified to perform EOR services for developments in the City of Reno. The list will be developed bi-annually. Firms must submit qualifications during the period requested and submit materials in compliance with the City's request for Statement of Qualifications (SOQ).
 - c. Shall attend the preconstruction conference initiated by the EOR.
 - d. Shall check and evaluate that adequate qualified inspection and testing personnel are on-site during the construction of public improvements. Should the QAI determine that adequate and/or qualified personnel are not available on-site for inspection or were not approved to perform inspection or testing prior to the start of the project, the QAI shall immediately advise the EOR of the situation and so record the incident.
 - e. Shall keep a daily log of sites visited and document any discrepancies noted including pertinent conversations with the EOR.
 - f. Shall, on a bi-weekly basis, review the daily inspection/testing reports submitted by the EOR. Any unsatisfactory test results shall be called to the attention of the EOR who shall take immediate action to correct the deficiency.
 - g. Shall evaluate the performance of the EOR's field inspection personnel.
 - h. The QAI retains the authority to evaluate the qualifications of the testing firm, testing technicians or field inspection personnel proposed for

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substitution after the evaluation of the SOQs. The QAI shall also have the authority to reject personnel not meeting the minimum qualifications.

- i. The quantity, if any, of asphalt patches that have occurred prior to final acceptance of a street, will be determined by the City of Reno. The patch quantity will be assessed a 300% penalty consistent with the "5-year, No Cut" policy enforced by the City of Reno. Said penalty will be due and payable prior to final acceptance by the City of Reno.

4. Contractor:

- a. Shall be responsible for construction of improvements. This responsibility shall include the means, methods, techniques, sequence, and procedures of construction and safety of the construction site. All such construction shall conform to the requirements of both the City Standards and the permitted plans of record. .
- b. Shall attend the pre-construction conference initiated by the EOR. The contractor shall present a proposed construction schedule including construction milestones, and designate a representative who has the authority to resolve issues during construction.
- c. Shall provide accessibility and exposure of all construction work subject to inspection until inspected by the EOR. Neither the City nor the EOR shall be liable for expenses entailed in the removal or replacement of any material required to allow inspection.
- d. Shall notify the EOR two (2) working days in advance of initiating construction of items outlined in Section 2d. of this chapter.
- e. Shall notify the EOR two (2) working days in advance of initiating construction or resuming construction after any unscheduled interruptions.
- f. Shall coordinate all sub-contractors for required inspections and testing.
- g. Is responsible for the permitting, installation, maintenance and performance of storm water pollution prevention devices. Shall perform daily inspections of the project storm water pollution prevention devices.
- h. The neglect or failure on the part of the EOR to condemn or reject materials or work shall not be construed to imply an acceptance of the material or work. The failure to reject any defective work or materials shall not in any way prevent later rejection when such defect is discovered and such failure shall not obligate the EOR or City of Reno to make final acceptance.

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- i. Is responsible to make available onsite and comply with all permits as required by the City of Reno and other permitting agencies.

SECTION 3 – EOR Inspection Requirements:

1. General:

Compliance with City standards shall also encompass the requirements of the approved design drawings and geotechnical report for the project.

For the purpose of implementing the requirements of this chapter, full-time inspection shall mean the EOR or his field inspector shall be present at all times to observe the operations of the contractor during the designated construction activity.

2. Grading, Excavation, and Fills:

Full-time inspection during placement of all materials, native or imported, to evaluate their compliance with City standards; that the subgrade is prepared according to City standards or per the requirements of the design geotechnical report; that all subgrade materials encountered are as expected according to the approved soils report, or if not, are appropriately addressed by over-excavation and stabilization with suitable material or as otherwise recommended in the approved soils report or by redesign of the pavement section.

3. Street Grades:

Inspection by survey, hand level or string line to determine that alignment and grade of sub-grade, base grade and finish grade of the street conforms to the improvement plans of record.

4. Underground Utilities:

- a. Inspection of pipe materials and bedding prior to the placing of any pipe to evaluate conformance with City standards. Photo records or copies of applicable manufacturer's certifications shall be documented.
- b. Inspection of installation of pipe laid to grade, to include mortar joints or gaskets prior to placing any material around or above pipe to evaluate conformance with City standards.
- c. Full-time inspection of each lift of backfill to evaluate conformance with City standards. The EOR, in the presence of utility personnel, shall verify

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all valves are "on" prior to paving, and shall provide documentation of inspection to QAI a minimum of 48 hours prior to paving.

- d. Inspection for pipe installation, not including backfill, by utility company shall be the responsibility of the appropriate utility.
 - e. Inspection of construction and/or installation of manholes, catch basins, and drop inlets to evaluate compliance with City standards.
 - f. Inspection of alignment and elevations to evaluate compliance with the improvement plans of record and specifications.
 - g. Verification of ball and mandrel testing as required.
 - h. Verification of ball vacuum testing of sanitary sewer manholes as required.
 - h. Video surveys (as discussed in Section 10) shall be performed on all lines after cleaning. Lines shall be flushed immediately prior to video survey.
5. Aggregate Base Courses for Streets, Curbs, Gutters, Sidewalks, and Alleys:

Inspection of all material brought to the site to evaluate uniformity with tested and approved submittals; inspection of placement and compaction of aggregate base to evaluate compliance with City standards and to confirm that grades conform to those specified in the improvement plans of record. This verification does not relieve the Contractor from remedying any un-noted deficiencies that may be discovered at a later date.

6. Reinforcing Steel, Forms, and Falsework:

Inspection of reinforcing steel, forms, and falsework prior to placement of concrete to evaluate compliance with the improvement plans of record, specifications, shop drawings and City standards.

7. Portland Cement Concrete:

Full-time inspection of all exposed concrete pours including curb, gutter, sidewalks, driveway apron, alleys, valley gutters, structures, headwalls, slope paving, roadway pavement, manholes, valve and monument collars to evaluate compliance with the improvement plans of record and City standards. The application of curing compound must be verified.

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8. Asphalt Concrete:
 - a. Full-time inspection to evaluate compliance with the improvement plans of record, details, specifications, and City standards.
 - b. As required by the QAI, inspection of the bituminous mixing plant shall be performed. This inspection shall include, but is not limited to, the following:
 - (1) Collection of asphaltic cement samples .
 - (2) Verification of lime addition to the mix.
 - (3) Verification of adequate mix temperature.
 - (4) Verification of asphalt cement type and a photo record or copy of refinery certification.

Should an unacceptable condition be observed, the QAI shall be informed immediately, and the EOR shall require corrective action.
 - c. Full-time inspection of the installation of all pavement markings for compliance to the manufacturer's specification for each product, improvement plans of record, MUTCD and City Standards.
 - d. Review of product submittals and verification of installation of traffic control devices in compliance with the improvement plans of record and City Standards.
9. Prime Coat, Tack Coat, Seal Coat and Surface Treatment:

Full-time inspection to evaluate compliance with City standards and application of slurry to all streets after assessment of patching and prior to final acceptance by the City
10. Testing and/or inspections required in addition to those listed in this Section. The following tests will be under the direction of the assigned EOR for the project. The City reserves the right to require additional testing and/or inspections at its discretion and the costs of which shall be the responsibility of the owner.
11. Landscaping and Irrigation within the City Right-of-way or within a Public Improvement Easement, Common Area Amenities:

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- a. No public landscaping or irrigation shall be accepted for maintenance by the City without being designated on the approved plans and a memo from the Parks and Recreation Department.
 - b. Sufficient inspections by a qualified professional to evaluate compliance with City standards, the improvement plans of record, and specifications.
 - c. Prior to acceptance of improvements within the project, the QAI will notify the Parks Division and make arrangements for an on-site inspection of the landscaping to make sure that the landscaping is healthy and that the irrigation system is in a good state of repair and meets City of Reno code requirements.
 - d. The QAI will notify the developer of any necessary plant replacements or irrigation repairs that are necessary prior to acceptance. Following any replacements or repairs, the QAI will arrange another on-site inspection with the Parks Division. When everything is acceptable and the developer has submitted drawings of record, then the QAI will notify the Parks Division of the date when the City accepts the improvements and becomes responsible for maintenance.
12. Sufficient inspection of the construction traffic control in active streets to review compliance with the City of Reno's issued encroachment permit traffic control plans and coordination with adjacent projects affecting the traffic flow. If the contractor is working in the City right-of-way in violation of such encroachment permit or without said permit, the EOR shall immediately notify the QAI.
13. Traffic Signals:
- a. Inspection of conduit, trenching, steel, concrete, footings, etc., in conformance with the relevant items of work from this section.
 - b. Layout and inspection of loops.
 - c. A complete inspection of the signal installation by experienced personnel or design traffic engineer

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SECTION 4 – Sanitary Sewer & Storm Drain Acceptance Methods:

1. Closed Circuit Television (CCTV) Inspection (Video Inspection of Sanitary Sewer and Storm Drain Lines):
 - a. The interior of all sanitary sewer and storm drain lines shall be inspected with a color CCTV camera. The CCTV inspection shall be performed after successfully passing a ball and mandrel test. The EOR or their field inspector shall be present for all CCTV inspections. The inspection shall be in digital MPEG format with audio location and date information, inspection title information that includes both hard copy and digital inspection logs. Video header information and inspection logs for the new pipe shall include, at a minimum, pipe identification (pipe ID) number as shown on the Improvement Plans and the manhole identifications (manhole IDs), as shown on the Improvement Plans. The digital inspection logs shall be submitted in PDF format with a filename equal to the pipe ID (example: pipe ID = 3243, filename = 3243.pdf). The pipe inspection video shall be submitted with a filename that includes the pipe ID and date of the video as shown in the following example (pipe ID = 3243, video date = April 8, 2010, filename = 3243CONSULT_04_08_2010.mpg). All digital files shall be submitted to the City on a DVD or USB Flash Drive. There shall be a separate MPEG file for each run of pipe (manhole to manhole reach) and each file shall be able to be viewed with Microsoft Windows Media Player. The CCTV inspection shall not be performed until after the pipeline and manhole structures are cleaned and all construction debris removed. The EOR shall verify the alignment and deflection testing has been performed prior to performing the CCTV inspection.
2. Submittals

The EOR shall submit a CCTV inspection video and written log of every pipeline after cleaning for each newly constructed pipeline. All inspections shall be recorded digitally and submitted in DVD MPEG format or approved equal on a USB Flash Drive or DVD. If the QAI or EOR determines that the CCTV is defective or not of adequate quality, the CCTV contractor shall CCTV inspect the pipeline(s) again at their expense.
3. Television Inspection Equipment
 - a. The EOR shall submit a CCTV inspection video and written log of every pipeline after cleaning for each newly constructed pipeline. All inspections shall be recorded digitally and submitted in DVD MPEG

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format or approved equal on a USB Flash Drive or DVD. VHS recordings will not be permitted. If the City Engineer determines that the CCTV is defective or not of adequate quality, the CCTV contractor shall CCTV inspect the pipeline(s) again at their expense.

- b. CCTV Camera(s) shall be intrinsically safe and shall be operative in 100 percent humidity conditions. Lighting intensity shall be remote controlled and shall be adjusted to minimize reflective glare. Lighting and camera quality shall provide a clear, in-focus picture of the entire inside periphery of the sewer or storm drain. The camera shall have an articulated head and be adjustable for height in order to have the camera centered in the pipe being televised. The camera shall have the capability of taking color still photos. The camera shall have pan and tilt capabilities.
- c. A footage counter device, which measures the distance traveled by the camera in the sewer, shall be accurate to plus or minus 0.5 feet in 1,000 feet. This counter shall be displayed on the recorded image at all times while inspecting pipe.
- d. Equipment shall include genlocking capabilities to the extent that computer generated data, (i.e., footage, date, size, address and location, etc.) can be overlaid onto the image, and both indicated on the television monitor and permanently recorded on the inspection video.

4. Inspection Methods

The Engineer of Record shall provide on-screen written narration of the inspection, the street location, upstream and downstream manhole control points from the Improvement Plans, date, and time of the inspection. Each inspection shall begin with the camera looking up at the manhole lid and end at the very next manhole, looking up at the manhole lid. The EOR or their representative shall be present at all video inspections and have access to observe the CCTV monitor at all times. The system of cabling employed to transport the camera and transmit its signal shall not obstruct the camera's view. It shall be the CCTV contractor's responsibility to locate and retrieve any non-functional, failed and/or stuck CCTV equipment at their expense. No spliced videos will be allowed for any single pipe section. Video must be obtained during one continuous pass beginning at a manhole and end at a manhole.

5. Image Perspective

The camera image shall be down the center axis of the pipe when the camera is in motion. The Contractor will be required to provide a 360-degree view of the pipe

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interior. Points of interest shall also be videotaped and shall include, but not be limited to, lateral connections, defects in the new pipe (including but not limited to, bumps, folds, tears, dimples, etc.).

6. Contractors Responsibility

The Contractor shall be responsible for any ensuing work required to remedy any problems that are subsequently identified by the City of Reno on the video tapes. All repairs shall be re-videoed a minimum of 30 days after the repairs have been made. QAI shall determine if the repaired sections can be video taped prior to 30 days after the actual repair and backfill is complete.

SECTION 5 – Sanitary Sewer & Storm Drain Pipeline Testing

1. Deflection Testing:

The EOR shall verify the trench is backfilled to finish grade prior to performing deflection testing. New pipe construction shall pass a rigid mandrel with a diameter of 95% of the pipe's inside diameter. The mandrel used shall be the type with an uneven number of vanes. Mandrel shall have an outside diameter (O.D.) equal to 95% of the inside diameter (I.D.) of the pipe. The inside diameter of the pipe, for the purpose of determining the outside diameter of the mandrel, shall be the average outside diameter minus two minimum wall thicknesses for O.D. controlled pipe and the average inside diameter for I.D. controlled pipe, all dimensions shall be per appropriate standard. Statistical or other "tolerance packages" shall not be considered in mandrel sizing. Mandrel shall be constructed of a metal or a rigid plastic material that can withstand 200 psi without being deformed. The mandrel shall have nine or more "runners" or "legs" as long as the total number of legs is an odd number. The barrel section of the mandrel shall have a length of at least 75% of the inside diameter of the pipe. A proving ring shall be provided and used for each size mandrel in use. Adjustable or flexible mandrels are prohibited. CCTV inspection will not be a substitute for deflection testing. It shall be the contractor's responsibility to locate and retrieve any lost or broken mandrels or other equipment left in the pipe during the testing process. Any damage resulting or repairs required from lost or broken equipment shall be at the contractor's expense.

2. Alignment Testing

The EOR shall verify the trench is backfilled to finish grade prior to performing alignment testing. An alignment test using a laser beam shall be performed. The

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laser beam shall be visible through the newly constructed pipeline between adjacent manholes.

3. Manhole Pressure Testing

The EOR shall verify that all labor, equipment and materials necessary to perform manhole vacuum testing has been provided. Vacuum test equipment shall be approved by the QAI. The vacuum testing shall be performed in the presence of the EOR or their representative.

a. Manhole Test Requirements

Each manhole shall be tested immediately after assembly and prior to backfilling. All lift holes shall be plugged with an approved non-shrink grout. All pipes entering the manhole shall be plugged securely. The test head shall be placed at the top of the cone section and the seal inflated according to the manufacturer's recommendations. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop one (1) inch. The manhole shall pass if the time is greater than 60 seconds for 48" diameter, 75 seconds for 60" diameter and 90 seconds for 72" diameter manholes. If the time lapse is less than described above, the EOR shall verify the necessary repairs are made prior to performing the retest. Retesting shall continue until a satisfactory test is obtained.

4. Sanitary sewer or storm drain facilities shall be recommended for acceptance to the City Council by the QAI based on the information contained in the reports of the previously mentioned tests and the verification of the EOR.

SECTION 6 - Testing Requirements:

Shall comply with the requirements set forth in the City Standards.

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SECTION 7 - Personnel Qualifications:

1. Engineer of Record (EOR):

An Engineer of Record who is retained as a consultant by the owner is required to be legally authorized to practice civil engineering or geological engineering in the State of Nevada in accordance with NRS Chapter 625, and maintain a valid City of Reno business license.

No firm may be retained as an EOR who is not on the City's current qualified EOR list. Firms which have not submitted qualifications during opening for the SOQ 2 year period will not be evaluated until the next open period. Any firm removed from the list for cause shall not be accepted as an EOR during the period they are disqualified.

A firm, a copartnership, a corporation or joint-stock association may engage in the practice of EOR for the City of Reno, if the member or members of the firm, copartnership, corporation or joint-stock association immediately responsible for engineering work performed in the City of Reno are Nevada licensed professional civil or geological engineers in accordance with NRS Chapter 625.

Every office or place of business of any firm, copartnership, corporation or joint-stock association engaged in the practice of EOR in the City of Reno shall have a registered professional civil or geological engineer in residence and in direct responsible supervision of the work needed to satisfy the requirements of this chapter conducted in such office or place of business.

An Engineer of Record shall be familiar with City Standards and all associated testing procedures.

2. Field Inspector:

a. General - The field inspectors' qualifications shall include sufficient education and experience to assure understanding of the quality control principles and the ability to implement the procedures related to their assigned duties.

The education and experience requirements specified below shall not be treated as absolute when other factors provide reasonable assurance that a person can competently perform a particular task. One factor may be "demonstrated capability" in a given job through previous performance.

Exhibit "A"

Chapter 6

- b. **Education and Experience** - To be considered qualified as a City of Reno approved field inspector, a candidate must meet the general requirements as mentioned above and satisfy at least one of the following requirements:
 - (1) High school graduate plus at least three years of construction quality control experience in equivalent testing, or inspection activities; or,
 - (2) Completion of college level work leading to an Associates degree in a related discipline plus at least two years of construction quality control experience in equivalent testing, or inspection activities; or,
 - (3) Four-year college degree in a related discipline plus at least six months of construction quality control experience in equivalent testing, examination or inspection activities.
- c. All personnel not presented in the Statement of Qualifications form or submitted to the QAI at the project preconstruction meeting shall submit a resume and a copy of all certifications to the QAI before commencing their duties. The QAI shall reject any candidate not meeting the minimum qualifications of this subsection. NAQTC and ACI certifications shall be current.

The field inspector shall be familiar with City standards and this chapter, as well as all associated testing procedures.

3. **Field Testing Technician:**

To be considered qualified as a City of Reno approved testing technician, the candidate must possess NAQTC certification in Sampling and Density and ACI Field Testing Technician – Grade I. All new personnel shall submit a resume to the QAI.

The testing technician shall be familiar with the testing procedures outlined in City standards.

4. **Qualified Testing Firm:**

- a. **General** - The testing services of the testing firm shall be under the direction of a registered Civil or Geological Engineer in the State of Nevada who is a full-time employee of the firm and has at least 5 years

Exhibit "A"

Chapter 6

engineering experience in the inspection and testing of soil, concrete, and asphalt. *The testing firm shall maintain a City of Reno business license.*

- b. Laboratory - The testing firm is responsible for laboratory testing of aggregate, soil, concrete and asphalt and shall have suitable test equipment and laboratory facilities for storing, preparing and testing samples. The firm shall have the capability and accreditations to perform all laboratory testing associated with its intended functions according to governing procedures and shall have the facilities and equipment required for all laboratory testing performed. If at any one time equipment or expertise in the performance of a specialized test is not available in-house, the services of a qualified subconsultant or his equipment may be utilized. *The testing firm laboratory shall be current in AASHTO accreditation (AMRL & CCRL) R-18 as well as aggregate, soil, concrete and asphalt tests as required in the Statement of Qualifications.*

- c. All personnel not presented in the Statement of Qualifications form or submitted to the QAI at the project preconstruction meeting shall submit a resume and a copy of all certifications to the QAI before commencing their duties. The QAI shall reject any candidate not meeting the minimum qualifications of this subsection. *NAQTC and ACI certifications shall be current.*

BUSINESS IMPACT STATEMENT

The following business impact statement was prepared pursuant to NRS 237.090 to address the proposed impact of adoption of amendments to the City of Reno Public Works Design Manual, Chapter VI - Quality Assurance Program (QAP):

1. The following is a description of the manner in which comment was solicited from affected trade associations or businesses, and a summary of their comments:

A. NOTICE

A notice was published in the Reno Gazette Journal notifying that interested persons could submit comments on or before December 15, 2015 to Charla Honey, Engineering Manager, P.O. Box 1900, Reno, NV 89505 or email:honeyc@reno.gov.

In addition, an email alert was sent out to the Bids, RFPs and RFQs email list and the 2016 – SOQ list which of approximately 888 individual email addresses from engineering consultants and other businesses which frequently do business with the City of Reno. The email alert included information regarding the method to provide public comment, the public comment period and the public meeting time and location.

The public notice and associated information was also sent to the American Society of Civil Engineers Truckee Meadows Branch (ASCE-TMB), the Builders Association of Northern Nevada (BANN), and the Associated General Contractors (AGC) for distribution to their members. The information regarding the proposed changes was posted on <http://www.reno.gov/government/departments/public-works/public-notices> and available at the Office of the City Clerk.

Further, a public workshop was held on December 1, 2015, at 10 a.m. at the Builders Association of Northern Nevada, at 5484 Reno Corporate Drive, Ste 100, Reno, NV 89511. There were six attendees at the meeting.

B. SUMMARY OF COMMENTS

Comments were received from the following businesses:

Marty Crew, CME incorporated

Kraig Knutsen, Tanamera

Bobbie Merrigan, Ryder Homes

Jim Smith, Wood Rodgers

Summary of Comments:

The concern expressed by the engineering and development representatives was that the proposed change to require full-time inspection of aggregate base materials was an economic burden on the developer and was unnecessary from an engineering perspective because base material properties, grade, thickness and density can be tested after the fact.

No other comments were received from businesses which would be affected by the proposed changes.

2. The estimated economic effect of the proposed ordinance on businesses, including, without limitation, both adverse and beneficial effects, and both direct and indirect effects:
 - a) Adverse effects: *None.*
 - b) Beneficial effects: *The update of Chapter VI of the Public Works Design Manual provides clarification to text and updates to the submittal requirements to clearly identify the current technology to be used for submittals. Requirements for companies offering services are defined and can be applied to all firms submitting Statements of Qualifications. Qualifications of firms and individuals providing services will be evaluated and a list of qualified consultants for Engineer of Record and Materials Testing will be created.*
 - c) Direct effects: *The engineering, construction and development community will have updated guidance for oversight of projects which are required to participate in the Quality Assurance Program.*

d) Indirect effects: *By creating and maintaining a list of qualified consultants to provide Engineer of Record and Materials Testing the City will ensure that all services provided will be provided by qualified firms. This will ensure that public improvements are constructed to meet City Standards.*

3. The following constitutes a description of the methods the local government considered to reduce the impact of the proposed change on businesses and a statement regarding whether any, and if so which, of these methods were used: (include whether the following was considered: simplifying the proposed rule; establishing different standards of compliance for a business; and if applicable, modifying a fee or fine set forth in the rule so that business would pay a lower fee or fine).

The proposed amendments were developed in cooperation with a Stakeholder Working Group made up of City staff, members from the engineering community and members from the development community. The Stakeholder Working Group drafted the proposed changes and evaluated comments received to ensure that there would be adverse effects on businesses.

4. The annual estimated cost to the local government for enforcement of the proposed ordinance.

There are no anticipated annual costs in addition to enforcement of existing rules.

5. If the proposed ordinance provides a new fee or increases an existing fee, the total annual amount the local government expects to collect and the manner in which the money will be used is.

Not applicable.

6. If the proposed rule includes provisions which duplicate or are more stringent than current federal, state or local standards regulating the same activity, the following explanation of why such duplicative or more stringent provisions are necessary is provided:

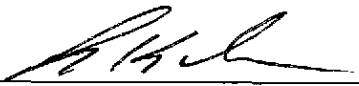
Not applicable.

7. Set forth the reasons for the conclusions regarding the impact of the proposed rule on business.

The proposed changes to the Design Manual were drafted with a Stakeholder Working Group made up of members from City staff, engineering consultants and the development community. After a lengthy public comment period and a public workshop, no comments in opposition were received from the industry regarding the draft revision of Chapter VI, indicating the industry is not opposed to proposed changes. Comments from the industry regarding the addition of full-time inspection requirement for placement of base materials were received in opposition and for that reason were not recommended for inclusion.

I, Andrew Clinger, City Manager, for the City of Reno, hereby certify that, to the best of my knowledge or belief, the information contained in the statement was prepared properly and is accurate.

Dated this 4TH day of JANUARY, 2016



Andrew Clinger, City Manager
City of Reno