***ADD THE FOLLOWING SECTION TO DIVISION II – CONSTRUCTION DETAILS***

SECTION 692 – SEWER PIPE AND STRUCTURE CLEANING

**DESCRIPTION**

**692.01.01 GENERAL**

1. This section specifies the requirements for cleaning of the sewers and sewer structures prior to video inspection, quality assurance inspection, and rehabilitation.

**692.01.02 REQUIREMENTS**

1. The work to be done under this Contract consists of furnishing all labor and equipment to remove and dispose of the accumulated sediments and clean the sewers and sewer structures as specified.
2. The Contractor shall clean existing sewers and sewer structures to be inspected or lined and prepare the surfaces for installation of liner or coating system or repair grout.
3. Cleaning of the sewer pipe with high-pressure hydraulic cleaning equipment, shall be required prior to installation of cured-in-place pipe (CIPP) liner in the existing pipelines, and manhole coating systems.
4. All materials dislodged during cleaning shall be removed from the work area and carried to an approved disposal site.
5. Cleaning of the sewer is required prior to video inspection of the sewer to view current line conditions.

**692.01.03 SUBMITTALS**

1. A letter shall be provided to the Engineer identifying the methods the Contractor plans to employ to remove sediment, debris, grease, scale, encrustations, and roots throughout the sewer to be lined and in the sewer structures to be repaired or coated. The letter shall include the following:
2. A detailed explanation of the cleaning process and a schedule of activities.
3. References where the Contractor has used the identified cleaning method successfully in the past 3 years.
4. A list of the actions planned to mitigate impact to the public during the cleaning operation.
5. The Contractor shall submit a copy of the certification document providing for the safe transport of the material cleaned from the project sewers.
6. The Contractor will provide copies of the dump site receipts to the Engineer.

**MATERIALS**

**692.02.01 CHEMICAL ADDITIVES**

1. No chemicals shall be used without written approval of the Engineer. In no case shall any chemical additive be used which might be considered hazardous, or might be considered detrimental to organisms or equipment of a wastewater treatment plant, or detrimental to old or new pipe materials.

**692.02.02 EQUIPMENT**

1. Equipment shall be capable of removing dirt, grease, rocks, sand, roots, and obstructions from pipelines and manholes.
2. High-Velocity, Hydro Cleaning Equipment:
3. High-Pressure Hose: 700 feet, minimum;
4. Hydraulically driven hose reel;
5. High Velocity Nozzle:
6. Two, minimum; and
7. Capable of producing scouring action from 10 degrees to 45 degrees in lines to be cleaned.
8. High-velocity Gun: Capable of producing flows ranging from fine spray to long distance solid stream;
9. Water Tank: 1,000-gallon storage, minimum;
10. Auxiliary engines and pumps;
11. Equipment Operating Controls: Locate above ground; and
12. Working Pressure: Minimum 2,000 pounds per square inch at 35 gallons per minute.
13. Mechanically-powered Equipment
14. Bucket Machine:
	* + - 1. Furnish with buckets in pairs, and with sufficient dragging power to perform work efficiently;
				2. Use V-belts for power transmission or have overload device. No direct drive machines permitted; and
				3. Equip with take-up drum and minimum 700 feet of cable.
15. If debris volumes in the pipeline are too large to remove with hydraulic jet cleaning equipment, cleaning shall be performed by the Contractor using a bucket machine.

**CONSTRUCTION**

**692.03.01 GENERAL**

1. The Contractor shall at all times conduct its work so as to prevent any blockage and minimize surcharging in the sewer manholes and connecting sewer pipelines. Damage to existing facilities as a result of the Contractor’s work shall be promptly repaired in kind at the Contractor’s expense.
2. When using hydraulically propelled cleaning tools that depend on water pressure to provide cleaning force, or tools that retard flow are used, take precautions to ensure that water pressure created does not damage or cause flooding of public or private property

**692.03.02 SEWER BYPASSING AND DEWATERING**

1. The sewer flow shall be bypassed during the cleaning of the sewers as specified in Section 695, “Diversion of Sewage Flow”.

**692.03.03 CLEANING**

1. Cleaning shall remove all sediment, rocks, debris, roots, grease accumulations and obstructions from the sewer to be lined and from the sewer structures to be coated.
2. Cleaning of the sewer and structure interior surfaces shall remove all grease, scale, and encrustation so that no foreign intrusion shall cause imperfections in the lining (e.g., bumps, folds, dimples).
3. During initial pipe cleaning, make a minimum of two passes through pipe segment.
4. During final pipe cleaning, make a minimum of one pass through the pipe segment.
5. Begin pipe cleaning at upstream end of system and proceed in downstream direction.
6. Structure Cleaning:
7. The entire manhole interior including frame, walls, and bench shall be cleaned prior to rehabilitation using either abrasive blasting and/or high-pressure water blast as recommended by the coating and/or repair product manufacturer, and approved by the Engineer, prior to coating installation. Where mechanical cleaning is accomplished by blast cleaning, the abrasive used shall be washed, graded and free of contaminants, which might interfere with the adhesion of the coatings. The air used for blast cleaning shall be sufficiently free of oil and moisture to not cause detrimental contamination of the surfaces to be coated. All concrete or mortar that is not sound or has been damaged by chemical exposure shall be removed to a sound, neutralized surface.
8. All contaminants including oil, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants shall be removed. Detergent water cleaning and hot water blasting may be necessary to remove oils, grease or other hydrocarbon residues from the concrete. A mild chlorine solution may be used to neutralize the surface to a ph of 7 in order to diminish microbiological bacteria growth prior to final rinse and coating system.
9. Contractor shall also remove all dirt, rocks, rust, spalled masonry (including mortar and concrete), roots, sludge, grease grit and other deleterious materials and debris from the interior manhole. The manhole shall be restored to the original surface profile. The finished interior surface shall consist of sound concrete or brick with adequate profile and porosity to provide a strong bond between the necessary repair materials and/or coating and the substrate. The first procedure upon entering each structure will be to blast all specified surfaces by low-pressure water cleaning followed by a low-pressure application of trisodiumphosphate (TSP). When all grease, oil and loose contaminated debris has been removed, the surface will be acid etched with a 20 percent muriatic acid solution to clean and open the pores of the substrate. The surface will then be water blasted by the use of hand held wand again, at 5,000 – 10,000 psi using turbo tip nozzles. The wash water shall include a dilute solution of chlorine to diminish microbiological bacteria growth and to kill any bacteria residing on or in the surface. The surface will be rinsed with copious amounts of clean potable water and then tested at this point to ensure that the pH is within acceptable limits (not to exceed 8.5). These tests will be performed with litmus paper on various areas within the structure. All tests will be retained for review by the Engineer.
10. Contractor shall also be responsible for any additional surface preparation beyond water blasting as required by the coating manufacturer. Where additional preparation is required, including abrasive blasting, shotblasting, grinding, scarifying or acid etching, the Contractor shall provide all labor, materials, and equipment as necessary, and at no additional cost to the Owner. Solid blast materials shall be collected, removed and disposed of in the same manner as other cleaning debris.
11. Any sediment or debris from cleaning operations larger than U.S. No. 8 sieve shall not be deposited downstream in the sewer main.
12. Sedimentation deposit downstream, as determined by the Engineer, shall be removed at no cost to the City.
13. The Contractor shall be thoroughly familiar with all phases of sewer and structure cleaning to ensure the completion of this Project without causing a health hazard or damage to the sewage system, public and private properties.
14. The Contractor shall clean the sewer and structures so that there are no visible rocks, debris, roots, grease accumulation and obstructions.
15. The Contractor shall clean the pipe and structures to ensure proper installation of the sewer liner and structures coating system and repair work.
16. The Contractor shall clean all exposed rebar to remove areas of corrosion down to solid steel and solid concrete.
17. Supply water for performing high-velocity hydro cleaning or flushing: Water may be obtained from the Las Vegas Valley Water District or City of North Las Vegas public water system. The Contractor shall obtain any necessary approval from and pay all permit fees to the Las Vegas Valley Water District or City of North Las Vegas prior to commencement of Work.
	* 1. **DISPOSAL OF SEDIMENTS**
18. The Contractor shall be responsible for obtaining all necessary permits and approval from all regulatory agencies required to perform the work, transporting and disposing, including all disposal fees, of any sediments and material removed from the sewer or structures. Remove sediments and material from cleaning operation at the end of each workday. Off-site disposal of all material removed from the sewer shall be the Contractor’s responsibility.
19. All sediment and debris removed from the sewer shall be disposed off-site in the APEX landfill. Hauling containers shall be watertight and shall be certified by the Clark County Health District. On-site stockpiling of removed material will not be permitted.

**METHOD OF MEASUREMENT**

**692.04.01 MEASUREMENT**

No unit of measurement will be made for SEWER PIPE AND STRUCTURE CLEANING.

The quantity of [FILL IN ITEM DESCRIPTION] will be measured per [UNIT].

No direct measurement shall be made for [FILL IN ITEM DESCRIPTION].

**BASIS OF PAYMENT**

**692.05.01 PAYMENT**

Unless otherwise provided in the Special Provisions, no payment will be made for SEWER PIPE AND STRUCTURE CLEANING as such. The cost thereof shall be considered as included in the unit price bid for construction or installation of the items to which such SEWER PIPE AND STRUCTURE CLEANING is required.

The accepted quantity of [FILL IN ITEM DESCRIPTION] will be paid for at the contract unit price of [UNIT] and shall include all materials, equipment and labor required including, but not limited to, [FILL IN] and all other items necessary to complete the work as shown on the Plans, as specified herein and as directed by the Engineer.

Unless otherwise provided in the Special Provisions, no payment will be made for [FILL IN ITEM DESCRIPTION] as such. The cost thereof shall be considered as included in the price bid for construction or installation of the items to which [FILL IN ITEM DESCRIPTION] is required.

**END OF SECTION 692**