Appendix C

Lighting and Electrical Design Evaluation

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PK Electrical, Inc.
Engineering · Design · Consulting

East William Street

30% Lighting and Electrical Design Memo

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Existing Conditions

The existing street lighting along the project corridor are street lights owned and operated by NV Energy (NVE). These lights are typically “nite-guard” style lights on the wooden utility poles on the south side of William Street, and ~25’ steel light poles with roadway cobrahead luminaires on the north side. The overhead power poles are planned to be demolished as part of this project and converted to underground.

Intersection lighting is owned and operated by Carson City, typically consisting of high output LED luminaires.

Lighting Infrastructure

There are three distinct sections as part of this project; downtown section from South Carson St east to Stewart St, Mills Park from Stewart St to Saliman Rd, and the eastern section from Saliman Rd to I-580.

For the downtown section we suggest using a decorative style light fixture, similar to the existing downtown Carson City lighting spaced approximately 90’ apart and are mounted at 12’ with a post top lantern style luminaire, installed approx. 30” from back of curb as space allows for ADA clear path. Lights will be installed along both sides of the roadway in this section.

For the remaining sections we suggest new cobrahead luminaires, using a similar style of the recent South Carson St project with steel poles with roadway luminaires. These poles follow NDOT specifications for type 7 (single head) and type 14 (dual head) poles, consisting of a 28.5’ high pole with a 15’ mounting arm, at a 34’-4” luminaire mounting height. Typical poles can be a single head type 7 pole, with dual head type 14 poles installed along Mills Park to provide additional lighting along the park pathway and parking areas.

Spacing will depend on the final scope of the lighting system. If lights are installed along both sides of the roadway, spacing can be approximately 275 ft. However, if lighting is only installed on the south side, the spacing will need to be reduced to approximately 175 ft. Lights will be installed at back of sidewalk, or outside of the clear zone if sidewalks are offset from the edge of roadway. Type 7 and 14 poles will be breakaway poles. Exact distribution and spacing will be determined by photometric calculations based on the streetscape layout. Photometric performance will be designed to meet the Illuminating Engineering Society (IES) recommended practice guide for roadway lighting; RP-8-18 “Roadway Lighting”.

For more uniform lighting, it is recommended that new lighting be installed on both sides of the roadway. This, however, comes at significant additional cost because it will require additional trenching, conduit, and wire. At a minimum new lighting will be installed along the south side of the roadway where the utility poles are removed and the lines are installed underground. The existing NVE lights along the north side of the roadway can remain in place. Some locations may need to be re-fed from underground.

Power Infrastructure

The new street lighting will be powered from new metered electric services installed in the project right of way. A service pedestal can typically serve out approximately 1000' radius while maintaining an acceptable voltage drop. Conductors will be designed to limit voltage drop to a max of 5% as recommended by the NEC. Branch circuit conductors will be installed in 2" (min) PVC conduit. Typical proposed services are 100A, 240V, single phase.

All downtown style light poles will have a GFCI receptacle installed for decorative string lights. Lights and receptacles will be controlled by a photocell switch for automatic dusk to dawn operation.

A minimum of two Level 2 electric vehicle charging stations will be provided in the Mills Park parking area. Service pedestals for these will be located nearby.

Utility Undergrounding

As the overhead utility poles between Carson St and Saliman Rd are removed and replaced with underground lines, addresses fed directly from the overhead lines will need to be converted to underground. Overhead to underground conversions typically require bringing underground conduit to the existing point of utility connection on the building or property into an underground pull section on the side of the building. New conduit is then routed on the building to re-feed the existing electrical infrastructure. The goal is to minimize impacts to the existing private electrical infrastructure. There are four addresses that may be affected and require work on the property to reconnect the utility services.

Cost Estimate

The rough order of magnitude costs are broken out between the different lighting scenarios as discussed above. The utility undergrounding cost is only for trenching, conduit, vaults, and equipment and does not include wire or transformers that may be required as part of the NVE design.

Utility Undergrounding (joint trench, conduit, vaults, pole removal, etc.) – N Carson St to Saliman Rd	$1,610,000
Underground utility conversions at four locations	$35,000
Downtown area lighting (conduit on south side installed in joint trench, new trench on north side) – N Carson St to Stewart St	$600,000
Lighting on south side only (conduit installed in joint utility trench where occurs) – Stewart St to Gold Dust Way	$500,000
Lighting on both sides (conduit on south side installed in joint trench where occurs, new trench on north side) – Roop St to Gold Dust Way	$890,000