9. UTILITIES

9.2 STORM DRAIN

The proposed storm drain mains will be located in the street right-of-way except for the storm drain main in the Wedge Park (bordered by Harney Way, West Harney Way, and Gilman Avenue). The proposed storm drain main in the Wedge Park will be located in a utility corridor parallel to West Harney Way because the West Harney Way Bus Rapid Transit (BRT) travel lanes do not allow for utility mains to be installed in the roadway.

The majority of storm water runoff within the Project area currently flows to the existing combined sewer system. The new sanitary sewer and storm drain collection systems will be separated, and ultimately no storm water from new development will be discharged to the existing combined sewer. The separated storm drain system will convey the storm water runoff to proposed outfalls that discharge to San Francisco Bay. The proposed outfalls will be constructed in Major Phases 2, 3, and 4.

In the interim, storm water from new development will be directed to the existing combined sewer that handles sewer and storm water flows. The total combined peak discharge to the existing combined sewer will not increase. Sanitary sewer flows will increase due to the new development. The increased sewer flow to the existing combined sewer will be offset by decreasing the storm water flowing to the existing combined sewer. This decrease will be attained by redirecting some of the storm water runoff that currently discharges to the existing combined sewer to two existing storm drain outfalls to the south, converting existing impervious area flowing to the existing combined sewer to pervious area, and/or providing temporary storm water detention facilities.

Where storm water is redirected to the two existing storm drain outfalls, the peak storm water discharge will not increase. The increase in drainage area that will lead to an increase in storm water discharge will be offset by converting existing impervious area to pervious area and/or providing temporary storm water detention facilities.

To facilitate the interim discharge of a portion of the storm water runoff from Major Phase 1 CP to the existing combined sewer main in Arelious Walker, the storm drain collection system serving most of Sub-phase CP-02 will be temporarily connected to the new sanitary sewer pump station located near the intersection of Ingerson Avenue and Harney Way. The pump station will pump the combined flow to the existing combined sewer in Arelious Walker. When the proposed outfalls mentioned above are constructed in the later phases, this temporary connection will be removed so that all storm water from proposed development is directed to the new outfalls.
For the Major Phase 1 CP, SS mains within CP-01 and CP-05 will be constructed and connected to the existing combined SS along Arelious Walker. SS mains within CP-02, CP-03 and CP-04 will flow to the pump station located at the intersection of West Harney Way and Ingerson Avenue. The flow will then be conveyed via force main and discharge to a manhole located at Arelious Walker and Hollister Avenue intersection. The sanitary sewer flow will then be conveyed via a gravity pipe to the existing combined sewer.

The Candlestick Points gravity sanitary sewer system will connect to the existing combined sewer main in Arelious Walker using new or existing manholes. Portions of the existing combined sewer system will remain, be relocated, or be demolished. The existing combined sewer in Arelious Walker, which is part of the Transport/Storage (T/S) system, will remain.

The existing combined sewer in Griffith Street and Fitzgerald Avenue east of Griffith Street will be relocated to Gilman Avenue, between Griffith Street and Arelious Walker. The relocated combined sewer will replace an existing combined sewer in Gilman Avenue, and will be a 54-inch diameter pipe to provide the same storage volume as the existing combined sewer.

An existing 24-inch combined sewer in Gilman Avenue, between Giants Drive and Arelious Walker, will be relocated. The relocated 24-inch combined sewer main will connect the existing combined sewer in Giants Drive to the relocated 54-inch combined sewer in Gilman Avenue.

The remaining existing combined sewer along Gilman Avenue, east of Arelious Walker, will be demolished in phases consistent with the Project phasing. The proposed sanitary sewer system follows the street layout and will be located in the street right-of-way except for the proposed sanitary sewer main parallel to West Harney Way, which will be located in a utility corridor in the Wedge Park.

Sanitary sewer mains are currently not planned to be installed in Arelious Walker, between Ingerson Avenue and Harney Way because the sanitary sewer generated by the CP retail development is expected to be served by the sanitary sewer mains either in Ingerson Avenue or Harney Way/West Harney Way. However, sanitary sewer mains will be installed in Arelious Walker to serve the future retail development if necessary.

Sanitary sewer mains are currently not planned to be installed in Jamestown Avenue because there are no developments along Jamestown Avenue.
The City’s low pressure water system (LPW) is the primary supply for domestic and fire suppression purposes.

The existing water mains in Carroll Avenue from Hawes Street to Arelious Walker and in Arelious Walker from Hawes Street to Donner Avenue will be demolished and replaced with a main in a parallel alignment. The existing 8-inch main in Arelious Walker between Donner Avenue and Gilman Avenue will be left in place and continue to be used if possible, however during final design it may be determined that this segment needs to be relocated to a different alignment. The remaining existing water mains within Sub-phases CP-01 and CP-05 will be demolished. Demolition of water main along Gilman Avenue east of Arelious Walker will be demolished in phases consistent with the Project phasing.

Proposed new water mains along Gilman Avenue, Carroll Avenue, Arelious Walker, Ingerson Avenue, West Harney Way, and Harney Way will be constructed to support the development of the Major Phase 1 CP. Temporary connection for existing facilities within the remaining Alice Griffith neighborhood will be provided.

The project LPW system will connect to the existing City LPW at the following locations:

• Connect to the existing 12-inch main in Harney Way that is connected to the existing 16-inch main in Giants Drive at the Harney Way and Arelious Walker intersection.
• Connect to the existing 8-inch main in Jamestown Avenue.
• Connect to the existing 16-inch main in Ingerson Avenue at the Ingerson Avenue and Giants Drive intersection.
• Connect to the existing 8-inch water main in Gilman Avenue at the intersection of H Street and Gilman Avenue.
• Connect to the existing 16-inch and 8-inch mains near the intersection of Gilman Avenue and Arelious Walker Street.
• Connect to the existing 8-inch main in Carroll Ave at the Hawes Street intersection with the new 12-inch main in Carroll Ave.
• Connect to the existing 8-inch main in Arelious Walker at the Donner Avenue intersection with the new 12-inch main in Arelious Walker.
• Connect to the existing 8-inch main in Arelious Walker with new mains in Fitzgerald, Egbert and Donner at the intersections with Arelious Walker.
• Temporarily connect to the existing water main in Alice Griffith near the intersection of Egbert Avenue and G Street.
In addition to the LPW system, the City operates the Auxiliary Water Supply System (AWSS), which provides high pressure water for fire protection.

For Major Phase 1 CP, AWSS lines will be constructed in Hawes Street, Carroll Ave, Arelious Walker, Gilman Avenue, Earl Street (between Gilman and Ingerson Avenue), Ingerson Avenue, Harney Way, and West Harney Way (south of Ingerson Avenue) to serve Major Phase 1 CP. The AWSS system will be designed and constructed by the City.
9. UTILITIES

9.6 RECYCLED WATER

The recycled water (RCW) will be served from interim cross-connections to the existing LPW system until an independent RCW supply is developed by the City. A double check detector assembly will be installed at each cross-connection to prevent backflow from the RCW to the LPW.

The layout of the proposed RCW is based on the proposed street right-of-way for CP-01 with two exceptions. Portion of West Harney Way adjacent to the Wedge Park will be located in a utility corridor in the Wedge Park. The other exception is the RCW in G Street, which crosses through Egbert Park in the Alice Griffith neighborhood.
**9. UTILITIES**

**9.7 JOINT TRENCH**

A joint utility trench system is planned for the project and will include the following dry utilities: electric, gas, telephone, cable TV and any ancillary communication facilities required by the San Francisco Public Utilities Commission (SFPUC).

Joint utilities on site shall be placed in a common trench located in the franchised area, under the sidewalk for mechanical protection and will be installed to maintain utility standard clearances from wet utilities and improvements. Vaults, boxes, manholes and enclosures housing equipment will be installed in the franchised area as well; their locations will be coordinated with wet utilities, other civil and architectural improvements and street lights.

The figure illustrates the general location of proposed joint trench facilities, an overhead line relocation on Harney Way, and identifies joint utility source locations. General system elements for each discipline or commodity are described briefly below.

Electric facilities provided by either PG&E or the SFPUC will include conduits, boxes, vaults, cables and devices including but not limited to switches, transformers, capacitor banks, and metering. The electric distribution system will consist of 600 and 200 amp 12kV underground primary distribution circuits throughout the project; transformers placed in strategic areas will supply residential, commercial and support facilities with secondary voltages below 600V.

The majority of equipment within the urban footprint will be subsurface. Transformers supplying energy to residential and commercial customers may be located either in the franchised area or on private property assuming that adequate operating space and access is provided. The limited use of pad mounted equipment will be necessary. The conceptual locations for this equipment have been defined on the periphery to minimize any negative impact on aesthetics within the urban plan.

Harney Way west of the project to Alana Way has an overhead system including 12kV electric facilities and Comcast fiber optic facilities. The overhead line will be relocated to accommodate the Harney Way widening.

Gas facilities provided by PG&E will consist of steel or plastic gas pipe, fittings, appurtenances and metering equipment.

Telephone facilities provided by AT&T and cable TV facilities provided by Comcast will consist of conduits, boxes, vaults and amplifiers to facilitate the installation and operation of copper and fiber optic cables as proposed by the communication providers (AT&T and Comcast).

Street lighting systems will consist of steel conduits, boxes, wiring and lighting units. A lighting unit will consist of a foundation, pole, mast arm, luminaire(s) and photocell. The street lighting system will utilize LED type lighting and provide photometric and lighting characteristics that are compliant with the San Francisco Department of Public Works Bureau of Engineering Standard Plans and Specifications.
The Automated Waste Collection System (AWCS) will consist of a network of underground piping to transport various streams of waste from a distributed network of inlets to a centralized collection facility. Components of the pipe network include: 22-inch to 24-inch diameter steel pipe buried within all street rights-of-way; branch piping and stub-outs on development lots and; buried concrete maintenance vaults at branch locations to provide access to underground piping. The central equipment room and collection facility houses a series of large suction fans, which direct waste to compactors for periodic removal by truck.

No AWCS currently exists on the project site or in the vicinity, therefore the capacity of the system will be phased and operations will not commence until the centralized collection facility is completed. The AWCS is currently scheduled to be commissioned at the end of Sub-phase CP-02. Phased installation of the system for Major Phase 1 CP is as follows:

CP-01 will consist of pipe on the north side of Donner Avenue between Arelious Walker Way to mid-block of G Street, north side of Fitzgerald Avenue between Arelious Walker Way to mid-block of G Street, and on the west side of Arelious Walker Way from Gilman Avenue to Donner Avenue. Stub-ins to building 1 and 2 off of Donner Avenue and stub-ins to lots 4 & 5 off of Fitzgerald Avenue will be capped in preparation for connection to waste chute once buildings are constructed.

CP02 will consist of pipe from Arelious Walker Way from CP01 to the newly constructed Collection Facility to Bill Walsh to Earl Street ending at Hollister Avenue (CP Center). Pipe will be on the south side of 8th Street from Bill Walsh to Harney Way. Completion of CP02 will allow the AWCS to be turned on and commissioned. The AWCS will be linked to the previous phase and commissioned for each subsequent Sub-phase after CP-02.

CP-03 will consist of pipe located on the north side of Ingerson Avenue from Arelious Walker Way to just northwest of West Harney Way.

CP-04 will consist of pipe located on the south side of Harney Way from mid-block of P Street and 9th Street to Ingerson Avenue. Pipe will be located from the previous main line on Ingerson Avenue to mid-blocks of the street between C Street and Harney Way for 9th Street, 8th Street, and 7th Street, and Ingerson Avenue.

CP-05 will consist of pipe in the Alice Griffith area on the north side of Fitzgerald Avenue connecting too existing pipe from G Street to mid-block of J Street.
How does an automated waste collection system work?

Users of an automated waste collection system deposit their waste into inlets, which are usually located on every building floor and at select public locations on sidewalks and within open spaces. Waste inlets are accessible 24 hours a day and designed to prevent large and unintended material from being deposited. There is one waste inlet for regular trash, one waste inlet for recycling items and, if required, a third inlet for compost.

After being deposited into an inlet, waste falls to the bottom of a chute where it is stored until a discharge valve releases it into the underground distribution network. Valves are opened periodically through the day, following a cycle that alternates among the different waste streams. “Photo eyes” located at collection points will allow the system to adjust collection timing if large volumes accumulate. All discharge valve assemblies have a ventilation mechanism that exchanges the air in the chute riser to prevent the accumulation of odors.

The waste is then transported via the underground network of pipe, which uses vacuum pressure and air velocity created by large suction fans. The fans draw waste to containers at the waste collection facility. When full, the containers are sent away for further processing. The exhaust air passes through a filter room to remove any remaining particulate matter before exiting to the outside air.

The system is remotely monitored and controlled by operators at the collection facility. In addition, there will be one full-time staff member needed to handle the system maintenance and monitoring. No personnel are needed in the actual collection and transport of waste from the collection point to the terminal station.
The development of Major Phase 1 CP is feasible from a geotechnical perspective. The project site features relatively dissimilar geotechnical conditions, which are considered and addressed in the design of the planned development. The geotechnical conditions for Major Phase 1 CP are summarized in this section and detailed in a geotechnical report for Major Phase 1 CP, which is included in Appendix A.

The historic predevelopment shoreline follows the southern and eastern edges of the Candlestick Point Center (CP Center) and Alice Griffith (AG) Redevelopment portions of the site. To the north of the historic shoreline, the site is predominated by shallow bedrock that is weathered near the existing ground surface and increases in strength with depth. To the south and east of the shoreline (towards the Bay), the site is underlain by fill over soft, compressible Bay deposits (Young Bay Mud). The fill is up to 40 feet thick at the CP Center site and 50 feet thick at AG. The Young Bay Mud is generally between 10 and 15 feet within the limits of both parts of the project; however, the Young Bay Mud is as thick as 50 feet in a limited portion of the CP Center site near the future intersection of Harney Way and Ingerson Avenue. The depth to bedrock to the bayside of the historic shoreline increases with depth from the shoreline. These two conditions (inland and bayward of the historic shoreline) provide dissimilar geotechnical constraints that will be addressed as follows:

- **Shallow bedrock** – in the area of the CP Center site within the footprint of the existing Candlestick Park and near Cameron Way, the shallow bedrock will present constraints relative to excavatability. These constraints will be mitigated through use of larger grading equipment and additional time and effort to excavate. The grading contractor will also process oversized material to reuse rock in areas of fill and reduce material offhaul.

- **Fill** – to the bay side of the historic shoreline, considerable amounts of fill is present. This fill is non-engineered and subject to liquefaction. The fill also contains considerable amounts of oversized material and deleterious material. Where feasible, fill conditions will be mitigated by removal and re-compacting or in-situ densification. Excavations into the fill will likely encounter groundwater requiring dewatering and treatment of the water removed prior to discharge.

- **Young Bay Mud** – Young Bay Mud settles under new loads from fill placement and building construction. Where feasible, we will mitigate this settlement with surcharging to pre-settle the soil or using lightweight fill to compensate for new fill without increasing the weight. Buildings over Young Bay Mud at AG will likely be founded on deep foundations, such as driven piles. Excavations into the Young Bay Mud will need to be laid back at milder slopes than typical or shored due to the soft soil conditions.

The bedrock in the area of the project may contain some amounts of naturally occurring asbestos. Some of the fill at each location was constructed out of material derived from the nearby bedrock. There is a chance that cuts into the existing bedrock and earthwork in the fill will encounter naturally occurring asbestos and a dust mitigation plan may be required to control airborne particles. These constraints will be mitigated by implementation of Asbestos Control and Dust Control Plans during grading, as appropriate.