Green Infrastructure Operations and Maintenance Plan for [SCHOOL NAME]

[ADDRESS]

The SFPUC and District agree to the following terms for the Operations and Maintenace of green infrastructure at [SCHOOL NAME].

- Summary of agency responsibility for maintenance and proposed maintenance plan, including agreed upon level of service for each BMP type proposed
- Estimated labor hours and associated costs
- Formal start and end dates for the maintenance period
- Annual reporting requirements, if applicable

Maintenance Responsibility Table for Typical BMP Components

| Maintenance Category | Frequency | Maintenance Activities | BMP Component | |
|--|------------------------|---|--|--|
| (PM) Typical / Preventative Maintenance | | Hand water, Prune & Trim | Planting | |
| | | Remove Weeds and Litter | Planting and Mulch | |
| | | Spot Mulch | Mulch | |
| | Quarterly | | Underdrain and cleanouts | |
| PM is a set of maintenance activities performed on Green Infrastructure at predetermined intervals or according | | Clean obstructing debris & sediment | Bubbler structure | |
| to prescribed criteria before the occurrence of a failure. These activities are intended to protect the installation, | Quarterry | | Street inlet structure | |
| reduce the probability of failure and prevent or eliminate the degradation of the functions of the installation. | | | Splash pad / forebay | |
| PM is a set of maintenance activities performed on Green Infrastructure at predetermined intervals or according to prescribed criteria before the occurrence of a failure. These activities are intended to protect the installation, reduce the probability of failure and prevent or eliminate the degradation of the functions of the installation. (RM) Remedial Maintenance RM is performed as required, on a scheduled or unscheduled basis in order to keep the installation in proper operating condition. This maintenance consists of a set of activities that are performed to eliminate an identified source of potential failure before that failure occurs. A type of remedial maintenance is condition-based predictiv maintenance, which depends on continuous or periodic condition monitoring of the installation to detect and identify the signs of potential failure. (CM) Corrective Maintenance CM is maintenance which is required when a portion or component of an installation begins to fail or has failed. Corrective maintenance keeps the installation in working order, or corrects of ailure of a component of the installation that has occurred or is in the process of occurring. This activity may consist of repair, restoration or replacement of individual components of the installation, not the entire installation. A type of corrective maintenance is Emergency Maintenance- corrective maintenance carried out as fast as possible in order to bring failed components of an installation back to a safe and operationally efficient condition. | | | Street curbcut inlet | |
| | | | Street curbcut outlet | |
| | | | Culvert/inlet pipe | |
| (RM) Remedial Maintenance | | Replace periodic dead plants | Planting | |
| | | Re-mulch | Mulch | |
| RM is performed as required, on a scheduled or unscheduled basis in order to keep the installation in proper | | Shallow Aeration / Tilling | Soil media | |
| α | | Maintenance Activities BMP Component tand water, Prune & Trim Planting temove Weeds and Litter Planting and Mulch jot Mulch Mulch Underdrain and cleanouts Bubbler structure Street inlet structure Street inlet structure Clean obstructing debris & sediment Splash pad / forebay Street curbcut outlet Culvert/inlet pipe teplace periodic dead plants Planting teplace periodic dead plants Planting belage or jet pipe Underdrain, cleanouts & culver belage or jet pipe Underdrain, cleanouts & culver belage or jet pipe Underdrain, cleanouts & culver belage missing or eroded material Soil media teplace missing or eroded material Soil media and mulch televel if unwanted ponding occurs Splash pad / forebay teplair damaged frame and/or grate Street curbcut unlet tepair damaged frame and/or grate Street curbcut outlet concrete chips and cracks Concrete splash pad / forebay concrete curb walls Check dams tepair damaged frame and/or grate Splash pad / | | |
| source of notential failure before that failure occurs. A type of remedial maintenance is condition-based predictive | Annually | Deep aeration | Soil media | |
| maintee of potential many based on constraint of the interview of the installation to detect and | | Replace missing or eroded material | Intenance Activities BMP Component Prune & Trim Planting eds and Litter Planting and Mulch Mulch Mulch Gamma and cleanouts Bubbler structure Street inlet structure Street curbcut inlet Street curbcut outlet Culvert/inlet pipe odic dead plants Planting Mulch Mulch ttion / Tilling Soil media pipe Underdrain, cleanouts & culvert ing or eroded material Soil media sting or eroded material Soil media taminants / Spills Planting, Mulch, Soil Media, Drain Rock wanted ponding occurs Splash pad / forebay ged frame and/or grate Bubbler structure ged frame and/or grate Street curbcut inlet street curbcut inlet Street curbcut outlet concrete splash pad / forebay Concrete splash pad / forebay ete chips and cracks Concrete curb walls concrete curb walls Concrete splash pad / forebay crete pad Splash pad / forebay ete chips and cracks Soil medi | |
| identify the signs of potential failure. | | Maintenance Activities BMP Component and water, Prune & Trim Planting move Weeds and Litter Planting and Mulch of Mulch Mulch and obstructing debris & sediment Underdrain and cleanouts Bubbler structure Street inlet structure Street curbcut outlet Street curbcut outlet Culvert/inlet pipe Planting | | |
| | | Re-level if unwanted ponding occurs | Splash pad / forebay | |
| (CM) Corrective Maintenance | | Repair broken pipe | Culvert and Underdrain and cleanouts | |
| | | | Bubbler structure | |
| | | Repair damaged frame and/or grate | Street inlet structure | |
| CM is maintenance which is required when a portion or component of an installation begins to fail or has failed. | | | Cleanouts | |
| Corrective maintenance keeps the installation in working order, or corrects a failure of a component of the | As-Needed | | Street curbcut inlet | |
| installation that has occurred or is in the process of occurring. This activity may consist of repair, restoration or replacement of individual components of the installation, not the entire installation. A type of corrective | | Splash pad / forebay Street curbcut inlet Street curbcut outlet Culvert/inlet pipe Re-mulch Mulch Shallow Aeration / Tilling Soil media Soil media Soil media Replace missing or eroded material Soil media Repair broken pipe Underdrain, cleanouts & culvert Repair broken pipe Culvert and Underdrain and cleanor Repair damaged frame and/or grate Bubbler structure Repair concrete chips and cracks Street curbcut outlet Concrete splash pad / forebay Concrete curb walls Check dams Remove & replace clogged material Replant entire system Planting Replant entire system Planting Soil media Check dams Aggregate rock storage layer Aggregate rock storage layer Replant entire system Planting Soil media Check dams Aggregate rock storage layer Underdrain and cleanouts Street curbcut outlet Check dams Replant entire system Planting Soil media Check dams | | |
| maintenance is Emergency Maintenance- corrective maintenance carried out as fast as possible in order to bring | | Repair damaged frame and/or grate Cleanouts Street curbcut inlet Street curbcut outlet Character of the splash pad / forebay Concrete curb walls Cherk dams | | |
| failed components of an installation back to a safe and operationally efficient condition. | | | Concrete curb walls | |
| | | | Check dams | |
| naintenance, which depends on continuous or periodic condition monitoring of the installation to detect and dentify the signs of potential failure. <u>(CM) Corrective Maintenance</u> CM is maintenance which is required when a portion or component of an installation begins to fail or has failed. Corrective maintenance keeps the installation in working order, or corrects a failure of a component of the installation that has occurred or is in the process of occurring. This activity may consist of repair, restoration or replacement of individual components of the installation, not the entire installation. A type of corrective maintenance is Emergency Maintenance- corrective maintenance carried out as fast as possible in order to bring failed components of an installation back to a safe and operationally efficient condition. <u>(R&R) Replacement and Rehabilitation</u> R&R is the reconstruction and replacement action performed on an installation after the occurrence of a failure of the entire installation. The goal of R&R is to rebuild the installation to its original condition and reestablish the designed performance levels of the installation. A type of R&R is breakdown maintenance, which is maintenance | | Remove & replace clogged material | Aggregate rock storage layer | |
| (R&R) Replacement and Rehabilitation | | Re-level concrete pad | Splash pad / forebay | |
| | | Replant entire system | Planting | |
| | | | Soil media | |
| | | | Check dams | |
| R&R is the reconstruction and replacement action performed on an installation after the occurrence of a failure of | | | ctivitiesBMP ComponentPlantingPlantingPlanting and MulchMulchMulchMulchBubbler structureBubbler structureStreet inlet structureStreet curbcut uiletStreet curbcut outletCulvert/inlet pipeitsPlantingMulchSoil mediaSoil mediaUnderdrain, cleanouts & culvertSoil mediaSoil mediamaterialSoil media and mulchbillsPlanting, Mulch, Soil Media, Drain Rocking occursSplash pad / forebayd/or grateBubbler structureStreet curbcut uiletStreet inlet structureCleanoutsStreet curbcut uiletstreet curbcut uiletStreet curbcut uiletconcrete splash pad / forebayconcrete splash pad / forebayconcrete splash pad / forebayI materialAggregate rock storage layersplash pad / forebayCheck damsAggregate rock storage layerUnderdrain and cleanoutsSil mediaCheck damsAggregate rock storage layerUnderdrain and cleanoutsStreet curbcut uiletStreet curbcut uilet | |
| the entire installation. The goal of R&R is to rebuild the installation to its original condition and reestablish the designed performance levels of the installation. A type of R&R is breakdown maintenance, which is maintenance | As-Needed | | Underdrain and cleanouts | |
| | | Excavate & replace entire component | Street curbcut inlet | |
| performed after the occurrence of an advanced catastrophic failure of the entire installation. R&R is different from | | Excavate & replace entire component | Street curbcut outlet | |
| Corrective Maintenance in that its activities affect the entire installation, not just components of the installation. | | | Culvert/inlet pipe | |
| | | | Concrete splash pad / forebay | |
| | | | Concrete curb walls | |
| | | | Bubbler structure | |
| Custodial Maintenance | Quartarly or As Needed | Pomovo Littor & Graffiti | Bioretention Planters | |
| | Quarterry of AS-Needed | | Concrete Surfaces | |
| | | | Signage & Accessories | |

Visitacion Valley Green Nodes



SFPUC Green Infrastructure Assets

Total Area of LID

2,747 sq. ft.

Number of Bioretention Cells

Legend



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Maximo Facility ID

Flow Direction

Check Dam



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|---|--|
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Overflow Area Drain

- Underdrain Cleanout
- Trench Drain

Inlet Structure

Sandtrap

Leland Avenue Rain Garden GI Maintenance Requirements

| | monthly | semi-annually | annual | as needed Approx. 3-5 years | |
|----------|--|---|--|---|---|
| ACTIVITY | Remove litter. Remove weeds. Trim vegetation as needed to maintain desired appearance. | Remove debris from inlets and outlets. Remove sediment/silt accumulations. Add mulch to bare areas. | Replace dead or diseased plants. Regrade soil surface if erosion, scouring or settling has occurred. Prune vegetation that inhibits line of sight at intersections. Prune or remove vegetation that interferes with facility O&M. | Test to ensure proper irrigation system function and sprinkler head adjustment- make appropriate repairs (at end of rainy season). Repair any rodent borrowing damage and eradicate rodents. | Aerate soil to ensure proper drain time. Re-mulch. |

Visitacion Valley Green Nodes



SFPUC Green Infrastructure Assets

Total Area of LID

998 sq. ft.

Number of Bioretention Cells

Legend



(## Maximo Facility ID



Bioretention System



Flow Direction



Overflow Structure

Check Dam

Sunnydale Mini-Plaza GI Maintenance Requirements

| | monthly | semi-annually | annua | as needed APPROX. 3-5 YEARS | |
|----------|--|---|--|---|---|
| ACTIVITY | Remove litter. Remove weeds. Trim vegetation as needed to maintain desired appearance. | Remove debris from inlets and outlets. Remove sediment/silt accumulations. Add mulch to bare areas. | Replace dead or diseased plants. Regrade soil surface if erosion, scouring or settling has occurred. Prune vegetation that inhibits line of sight at intersections. Prune or remove vegetation that interferes with facility O&M. | Test to ensure proper irrigation system function and sprinkler head adjustment- make appropriate repairs (at end of rainy season). Repair any rodent borrowing damage and eradicate rodents. | Aerate soil to ensure proper drain time. Re-mulch. |

Bioretention System Maximo Asset ID

| Asset Type | GI-VIS-VVG-BRS01 | GI-VIS-VVG-BRS02 | GI-VIS-VVG-BRS03 | GI-VIS-VVG-BRS04 | GI-VIS-VVG-BRS05 | GI-VIS-VVG-BRS06 | GI-VIS-VVG-BRS07 | GI-VIS-VVG-BRS08 |
|---------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Checkdam | CKDM-0126 | | CKDM-0127 | CKDM-0128 | | | CKDM-0129 | |
| Aggregate | DAGM-0066 | DAGM-0067 | DAGM-0068 | DAGM-0069 | DAGM-0070 | DAGM-0071 | DAGM-0072 | DAGM-0073 |
| Distribution Pipe | EQDP-0022 | EQDP-0023 | | | EQDP-0024 | EQDP-0025 to 28 | | |
| Inlet Structure | INLS-0014, -0015 | | | | | INLS-0016, -0017 | | |
| Irrigation | IRRG-0041 | IRRG-0042 | IRRG-0043 | IRRG-0044 | IRRG-0045 | IRRG-0046 | IRRG-0047 | IRRG-0048 |
| Media | MDIA-0065 | MDIA-0066 | MDIA-0067 | MDIA-0068 | MDIA-0069 | MDIA-0070 | MDIA-0071 | MDIA-0072 |
| Overflow Structure | | OVFS-0013 | | | OVFS-0014 | OVFS-0015 | OVFS-0016 | OVFS-0017 |
| Trench Drain | | | TRDR-0015 | | | | | |
| Underdrain | UNDR-0023 | UNDR-0024 | UNDR-0025 | UNDR-0026 | UNDR-0027 | | | |
| Sand Trap | | | | | | SDTP-0001 | | |
| V-Ditch | | | | | | VDCS-0001 | | |
| Backflow Preventer | | | | | | BFPR-8015 | BFPR-8014 | |

Leland Avenue Cleanout



Leland Avenue Overflow Area Drain



Leland Avenue Bioretention Cross-Section



Leland Avenue Inlet Structure Cross-Section



Sunnydale Avenue Bioretention Cross-Section

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nnydale Avenue Overflow Structure

Leland Avenue Sandtrap

