**CITY OF BURLINGAME**
**PARKS & RECREATION DEPARTMENT**
850 Burlingame Avenue Burlingame, California 94010
Telephone: (650) 558-7300 • Parks/Trees (650) 558-7330
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**ADDENDUM NO. 1 -** Distributed via email and posted on the City of Burlingame website at: www.burlingame.org/washingtonplayground

To: All Plan Holders

From: Karen Hager, City of Burlingame Management Analyst

Washington Park Playground, Sports Court, & Picnic Area - City Project Number 85670

Addendum Issue Date: 04/18/2019

NOTICE TO ALL CONTRACTORS SUBMITTING BIDS FOR THIS WORK AND TO ALL PLAN HOLDERS:
You are hereby notified of the following changes, clarifications or modifications to the original Contract Documents, Project Manual, Drawings, Specifications and subsequent Addenda. This Addendum shall supersede the original Contract Documents, and previous Addenda wherein it contradicts the same and shall take precedence over anything to the contrary therein. All other conditions remain unchanged.

**Basic Project:**

**INFORMATION & UPDATES FROM THE CITY OF BURLINGAME:**

1. Heritage Tree will be purchased by the City. Contractor to pick-up heritage tree from City's Parks Yard located at 420 Carolan Avenue and plant as specified.
2. Updated Agreement for Public Improvement (See Attached)
3. Updated Supplementary Conditions (See Attached)

The following drawings and project manual sections have been modified. See narrative below for description. Drawings and project manual sections from the narrative below are issued in the bid addendum

## DRAWING REVISIONS

**ARCHITECTURAL DRAWINGS**

4. **Sheet A0.0:** Per Building Department Comment: added applicable Codes to this project and additional CALGreen checklist sheets in sheet index.
5. **Sheet A0.3-1:** Add CALGreen Checklists
6. **Sheet A0.3-2:** Add CALGreen Checklists
7. **Sheet A0.3-3:** Add CALGreen Checklists
8. **Sheet A1.1-0:** Update landscape backgrounds per revisions made on Sheet L3.1. See narrative below for Sheet L3.1.

**CIVIL**

9. **Sheet C1.0:** Per City Public Works Comment, added "Public Works Notes"
10. **Sheet C1.0:** Per Building Department comment, added "constructions hours-onsite"
11. **Sheet C4.0:** Per contractor's question on AC section, revised to 2.5"AC/8" AB CL. II per geotechnical report

12. **Sheet C5.0:** Per City Public Works comment, the irrigation service to be installed by City. Utility keyed note **number 15 revised**
13. **Sheet C5.0:** Per City Public Works comment, 12" storm drain pipe material revised to PVC
14. **Sheet C5.0:** Added utility keyed note number 18 and 19 for the CCTV of the existing storm drain line and manhole
15. **Sheet C5.0:** Per City Public Works comment, the proposed irrigation lines have been added in the background of the utility sheet. Added utility keyed note number 21
16. **Sheet C5.0:** Per City Public Works comment on the existing water line supplying water to the bathroom and water fountain, a new 2" domestic water service has been added to the utility sheet to supply water to the new water fountains. A note has been added to the utility plan for the contractor to pothole and field verify the water supply to the bathroom and the existing water fountain.
17. **Sheet C6.0:** Per City storwmater comment, added a note on sheet C6.0 to stencil storm drain inlets with "No Dumping-Flows to Bay"
18. **Sheet C8.0:** Per City Public Works comment, a note added "ADA Access to Lions Club Hall must be maintained at all time"
19. **Sheet C8.0:** Per City Public Works comment about providing ADA access to Lions Club, pedestrian access to the remaining of park, bathroom and baseball field, a general note added to sheet C8.0 "Contractor to provide logistics plan for the construction phase. Logistics plan to be submitted to the City of Burlingame for review and approval. Logistics plan to include pedestrian access to the portion of the park to remain open, access to the existing bathroom and baseball field"

**LANDSCAPE**

20. **Sheet L2.0:** 5 foot-wide accessible path added for picnic area south of multi-use court.
21. **Sheet L3.1:** Picnic area south of multi-use court expanded configuration and 5 foot-wide access path revised with stabilized decomposed granite (dg) replacing a portion of the turf. Wood header to define stabilized dg. Reduction of turf. Benches installation embedded per detail 7/L4.2.
22. **Sheet L3.1:** Baseball backstop (2 courses) 2x12 pressure treated wood boards attached to back of backstop to retain concrete (71 LF).
23. **Sheet L3.1:** Per City plan check comment, added note see Layout Plans L5.1 and L5.2 for dimensions.
24. **Sheet L3.2:** Per City plan check comment, added note see Layout Plans L5.1 and L5.2 for dimensions.
25. **Sheet L4.0:** Revised detail 1/L4.0, compacted aggregate base increased to 8 inches for loading purposes.
26. **Sheet L4.0:** Revised detail 8/L4.0, increased concrete thickness to 18 inches**.**
27. **Sheet L4.2:** Revised detail 6/L4.2, added drain line distance parameters to 25 feet and updated code information.
28. **Sheet L5.1:** Added dimensions and coordinate points for picnic area configuration.
29. **Sheet L5.1:** Added legend of coordinate points per plan check comment.
30. **Sheet L5.2:** Added legend of coordinate points per plan check comment.
31. **Sheet L6.0:** Revised spray nozzles from Hunter to Toro for spray head compatibility.
32. **Sheet L6.1:** Revised irrigation layout for expanded picnic area and reduced turf area south of multi-use court.
33. **Sheet L6.2:** Revised irrigation required an additional valve.
34. **Sheet L6.7:** Revised WELO calculations based on reduction of turf for the expanded picnic area and reduction of shrubs for the access path.
35. **Sheet L7.0:** Revised shrub plant quantities for picnic area access path.
36. **Sheet L7.0:** Added turf sod hatch to Legend and reference to specifications.
37. **Sheet L7.2**: Revised shrub plant layout and quantities for picnic area access path**.**

**ELECTRICAL**

38. No Electrical/lighting Drawings or Specifications are being issued in this Addendum. It is noted that landscape backgrounds on these electrical/lighting drawings are outdated. Please refer to landscape drawings issued in Addendum #1 and coordinate electrical/lighting with revised landscape plans.

## PROJECT MANUAL REVISIONS

**SPECIFICATIONS**

39. **Specification 33 4100:** Storm Utility Drainage Piping
40. **City of Burlingame SD Specs 02700.pdf:** Per City Public Works, added specification section

## INCLUDED SUPPLEMENTAL INFORMATION

**Below is supplemental information included as part of this Addendum:**

41. **BCC Geotechnical Report.PDF**
42. **Updated Agreement for Public Improvement (See Attached)**
43. **Updated Supplementary Conditions (See Attached)**

## QUESTIONS AND RESPONSES

**Below are additional addendum items in response to bidders' RFIs:**

1. Please clarify if required: Section 01 5000 Temporary Facilities - 2.3 B Common use field office, 3.6 A Temporary lighting, 3.13 C Site security. **The above listed requirements within Section 01 5000 Temporary Facilities are not required.**

2. Please provide the geotechnical report. **Please see BCC Geotechnical report.pdf included in Addendum #1.**

3. Section 32 11 00 3.6A Lime stabilization - please clarify. **Lime Stabilization is not required.**

4. Section 32 11 00 2.1A - Class 2 , 1 1/2" maximum is not a commercially available product produced locally. Is 3/4" maximum recycled base acceptable? **It is acceptable to use 3/4 inch base. Recycled base only allowed at impermeable pavements per Geotechnical recommendation**

5. Please clarify the access routes for material deliveries and material exporting. And, what is required of the contractor for any damage to existing pavement. Perhaps an allowance on a per square foot basis for any repair?
   **Potential access routes are as follows:**
   a. **Coming through the school and the Parks Yard.**
   b. **Coming through the existing entry (between existing Historic Pillars) directly from Burlingame Avenue.**
   c. **Coming through the northeast corner of the Lions Club parking lot.**

   **Contractor to patch and repair any damage to existing pavement as necessary to maintain safe access and before the project is completed.**
   **Consistent with Section 011100-1.4, the Contractor is responsible for documenting, protecting, maintaining, and restoring to as necessary any and all areas used by the contractor between the public right of way and the limit of work during the course of construction, including but not limited to access routes. Restoration work, if necessary, shall be to the practical and reasonable level that meets or exceeds the documented conditions prior to the start of construction activities.**
   **For areas outside of the limit of work that are accessible to the general public, protective and restorative measures shall be coordinated with the City immediately upon discovery by any party. Areas outside of the limit of work that sustain damage during construction due to construction activities shall be immediately secured from public access by the Contractor and restored quickly in coordination with the City to maintain a safe park and school environment for all park and school users throughout construction.**

6. Please verify that the playground equipment installed by others will occur after the placement and final grading by the site contractor.
   **Ross Recreation (the playground equipment vendor) requests that the base rock is in place and compacted (90-95%) by the Site Contractor before installing the posts and play equipment. This makes it easier to ensure compaction as they won't have to go around all of the play equipment.**

7. Will Encroachment permits be required and if so, city or contractor to carry cost?
   **Per City of Burlingame public works: Any work within the street, sidewalk, public easements and utility easements will require an encroachment permit. Also for any debris/garbage container placed within the city right of way (approximately 17.1 feet from the face of curb), an encroachment permit will be required. Per 5.06 the City General Conditions the City will waive the permit fees.**

8. Designated Contractor's lay down area?
   **No specific laydown area is designated by the City as this may need to move around throughout construction. There are a number of small to medium areas within the project extents that should be sufficient during various phases of the project. No expanding the fence line for this project for laydown area. Contractor to submit staging plan to City for approval.**

9. Testing "local materials" by testing contractor expenses – please defined "local materials"? **Materials that are already on site and want to be reused or recycled by the Contractor, (ex. aggregate base) then the Contractor must pay for the testing to see if they are of equivalent quality to material that are sorted and graded offsite.**

10. Multi- Use Court, asphalt section as shown per scale detail on sheet L4.0? only detail reference provided.
    **See Civil Plan C4.0 for call out and Landscape Plans L3.1 and details 1/L4.0 and detail 2/L4.0. Note: detail 1/L4.0 has been revised in Addendum #1. The 2.5 inch of AC over 8 inch of compacted class 2 aggregate base and the Asphalt Paving Section 32 1216 applies to the multi-use court.**

11. Chlorination test required for drinking fountain? **No chlorination test is required.**

12. Per specs 01-7900-2, 1.4 Quality Assurance – A Facilitator, B Instructor, Photographer, qualifications required? QA & QC costs per contractor. **Instruction programs are required; however, photography/videotaping of instruction is not required. 017900-2.1 identifies three areas where instruction programs are anticipated: Equipment, which may include the playground or other types of installed equipment; lighting and its controls; and irrigation systems. Part 1.4 A, B, and C explain the criteria for facilitators, instructors, and photographers. The qualifications for facilitators are flexible, and could potentially be performed by the contractor's own staff. The instructor qualifications are quite clear-it is a factory-authorized service representative.**

13. CALGreen applies to playground project? **Per building department, yes, CALGreen applies. Please see Addendum #1 drawing sheets A0.3-1, A0.3-2, A0-3.3 (confirm sheet numbers match that being issued).**

14. Section 01-8121 Environmental Impact of Materials, section applies to playground project? **No, this section may be removed in its entirety.**

15. Recycled ¾" Aggregate base, acceptable? **(duplicate question). It is acceptable to use 3/4 inch base. Recycled base only allowed at impermeable pavements per Geotechnical recommendation.**

16. Spec 33-41-00, 3.11 TV Inspection, will this be required? **Yes. CCTV of the existing and new storm drain is required. Please see specification 33 4100 Storm Utility Drainage Piping, section 3.10 Television Inspection.**

All bidders shall acknowledge receipt and acceptance of Addendum No. 1 by signing in the space provided at the end of this Addendum and submitting the signed Addendum with their proposal. Failure to do so may constitute grounds for rejection of the bid.

_____ _____
Contractor Signature Date

_____
Company Name

End of Addendum No. 1

# PACKAGE 1: WASHINGTON PARK
# PLAYGROUND, SPORTS COURT, AND PICNIC AREA

850 BURLINGAME AVENUE, BURLINGAME, CA 94010
CITY OF BURLINGAME PROJECT NUMBER: 85670
BID SET: MARCH 25, 2019

## PROJECT TEAM


**ARCHITECT:**
GROUP 4 ARCHITECTURE RESEARCH + PLANNING:
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CONTACT: DAWN MERKES

**CIVIL:**
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SAN JOSE, CA 95112
T: (408) 467 9126

CONTACT: SCOTT SCHORK

**LANDSCAPE:**
RHAA
323 GEARY STREET
SAN FRANCISCO, CA 94102
T: (415) 861 7900

CONTACT: JAMES INGELS

**ELECTRICAL & LIGHTING:**
O'MAHONY & MYER
4340 REDWOOD HWY, STE 245
SAN RAFAEL, CA 94903
T: (415) 492 0420
F: (415) 479 9662

CONTACT: PAUL CAREY


## SHEET INDEX


| | |
|---|---|
| A0.0 | COVER SHEET & SHEET INDEX |
| A0.3-1 | CALGREEN CHECKLIST |
| A0.3-2 | CALGREEN CHECKLIST |
| A0.3-3 | CALGREEN CHECKLIST |
| A1.1-0 | SITE PLAN |
| C1.0 | GENERAL NOTES |
| C2.0 | EXISTING CONDITIONS |
| C3.0 | DEMOLITION PLAN |
| C4.0 | GRADING AND DRAINAGE PLAN |
| C5.0 | UTILITY PLAN |
| C6.0 | STORM WATER CONTROL PLAN |
| C7.0 | STORM WATER CONTROL DETAILS |
| C8.0 | EROSION CONTROL PLAN |
| C9.0 | EROSION CONTROL DETAILS |
| C10.0 | CONSTRUCTION DETAILS |
| C11.0 | CROSS SECTIONS |
| C12.0 | BEST MANAGEMENT PRACTICES |
| L0.0 | LANDSCAPE NOTES & LEGEND |
| L0.1 | KEY PLAN |
| L1.0 | TREE PROTECTION & REMOVAL PLAN |
| L1.1 | TREE PROTECTION & REMOVAL PLAN |
| L2.0 | ACCESSIBILITY PLAN |
| L3.1 | CONSTRUCTION PLAN |
| L3.2 | CONSTRUCTION PLAN |
| L4.0 | CONSTRUCTION DETAILS |
| L4.1 | CONSTRUCTION DETAILS |
| L4.2 | CONSTRUCTION DETAILS |
| L5.1 | LAYOUT PLAN |
| L5.2 | LAYOUT PLAN |
| L6.0 | IRRIGATION NOTES & LEGEND |
| L6.1 | IRRIGATION PLAN |
| L6.2 | IRRIGATION PLAN |
| L6.3 | IRRIGATION DETAILS |
| L6.4 | IRRIGATION DETAILS |
| L6.5 | IRRIGATION DETAILS |
| L6.6 | IRRIGATION DETAILS |
| L6.7 | IRRIGATION WATER USE CALCULATIONS |
| L7.0 | PLANTING NOTES & LEGEND |
| L7.1 | TREE PLAN |
| L7.2 | PLANTING PLAN |
| L7.3 | PLANTING PLAN |
| L7.4 | PLANTING DETAILS |
| ES0.1 | SYMBOLS LIST, GENERAL NOTES, LIST OF DRAWINGS, LUMINAIRE SCHEDULE |
| ES1.1 | SITE PLAN - ELECTRICAL |
| ES7.1 | DETAILS |
| ES8.1 | TITLE 24 DOCUMENTS |


## PROJECT SCOPE OF WORK:

PACKAGE 1: WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA
THE PROPOSED PROJECT CONSISTS OF THE FOLLOWING:
- PLAYGROUND AREA
- SPORTS COURT
- PICNIC AREA
- ASSOCIATED SITEWORK AND LANDSCAPING

PACKAGE 2: BURLINGAME COMMUNITY CENTER (NOT IN THIS CONTRACT)
- COMMUNITY CENTER
- ASSOCIATED SITEWORK AND LANDSCAPING
- SURFACE / UNDERGROUND PARKING

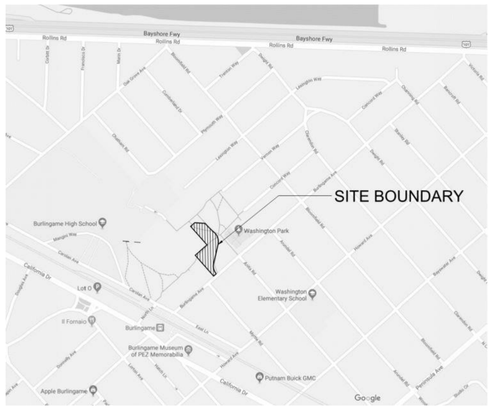
## APPLICABLE CODES:

ALL CONSTRUCTION WORK SHALL COMPLY WITH THE 2016 CALIFORNIA BUILDING STANDARDS CODE (CALIFORNIA CODE OF REGULATIONS, TITLE 24) AND ALL LOCALLY ADOPTED AMENDMENTS & REGULATIONS.

APPLICABLE CODES INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

2016 CALIFORNIA BUILDING CODE WITH CITY OF BURLINGAME AMENDMENTS (CBC)
2016 CALIFORNIA ELECTRICAL CODE WITH CITY AMENDMENTS (CEC)
2016 CALIFORNIA PLUMBING CODE (CPC)
2016 CALIFORNIA ENERGY EFFICIENCY CODE (CEEC)
2016 CALIFORNIA FIRE CODE WITH CITY OF BURLINGAME AMENDMENTS (CFC)
2016 CALIFORNIA MECHANICAL CODE (CMC)
2016 CALIFORNIA GREEN BUILDING STANDARDS CODE (CGBSC)
2010 ACCESSIBLE DESIGN STANDARDS (ADA)
BURLINGAME MUNICIPAL CODE

## LOCATION MAP:





GROUP 4
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**WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA**

**850 BURLINGAME AVE BURLINGAME CA 94010**

| | |
|---|---|
| Project Arch. | ---- |
| CA REG. | ---- |
| PROJECT: | 12421-04 |

| ISSUE | DATE |
|---|---|
| SCHEMATIC DESIGN | 11/02/18 |
| BID SET | 3/25/2019 |
| 1 ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.
COVER SHEET & SHEET INDEX

A0.0

# 2016 CALIFORNIA GREEN BUILDING STANDARDS CODE
## NONRESIDENTIAL MANDATORY MEASURES, SHEET 1 (INCLUDING JANUARY 1, 2017 ERRATA)

AIA|CC CALIFORNIA COUNCIL

INSPECTOR SIGNOFF

## CHAPTER 3
## GREEN BUILDING
### SECTION 301 GENERAL

**301.1 SCOPE.** Buildings shall be designed to include the green building measures specified as mandatory in the application checklists contained in this code. Voluntary green building measures are also included in the application checklists and may be included in the design and construction of structures covered by this code, but are not required unless adopted by a city, county, or city and county as specified in Section 101.7.

**301.3 NONRESIDENTIAL ADDITIONS AND ALTERATIONS. [BSC]** The provisions of individual sections of Chapter 5 apply to newly constructed buildings, building additions of 1,000 square feet or greater, and/or building alterations with a permit valuation of $200,000 or above (for occupancies within the authority of California Building Standards Commission). Code sections relevant to additions and alterations shall only apply to the portions of the building being added or altered within the scope of the permitted work.

A code section will be designated by a banner to indicate where the code section only applies to newly constructed building [N] or to additions and alterations [A]. When the code section applies to both, no banner will be used.

**301.3.1 Nonresidential additions and alterations that cause updates to plumbing fixtures only:**

**Note:** On and after January 1, 2014, certain commercial real property, as defined in Civil Code Section 1101.3, shall have its noncompliant plumbing fixtures replaced with appropriate water-conserving plumbing fixtures under specific circumstances. See Civil Code Section 1101.1 *et seq.* for definitions, types of commercial real property affected, effective dates, circumstances necessitating replacement of noncompliant plumbing fixtures, and duties and responsibilities for ensuring compliance.

**301.3.2 Waste Diversion.** The requirements of Section 5.408 shall be required for additions and alterations whenever a permit is required for work.

301.4 PUBLIC SCHOOLS AND COMMUNITY COLLEGES. (see GBSC)
301.5 HEALTH FACILITIES. (see GBSC)

### SECTION 302 MIXED OCCUPANCY BUILDINGS

**302.1 MIXED OCCUPANCY BUILDINGS.** In mixed occupancy buildings, each portion of a building shall comply with the specific green building measures applicable to each specific occupancy.

### SECTION 303 PHASED PROJECTS

**303.1 Phased projects.** For shell buildings and others constructed for future tenant improvements, only those code measures relevant to the building components and systems considered to be new construction (or newly constructed) shall apply.

**303.1.1 Tenant improvements.** The provisions of this code shall apply only to the initial tenant or occupant improvements to a project. Subsequent tenant improvements shall comply with the scoping provisions in Section 301.3 non-residential additions and alterations.

### ABBREVIATION DEFINITIONS:

| | |
|---|---|
| HCD | Department of Housing and Community Development |
| BSC | California Building Standards Commission |
| DSA-SS | Division of the State Architect, Structural Safety |
| OSHPD | Office of Statewide Health Planning and Development |
| LR | Low Rise |
| HR | High Rise |
| AA | Additions and Alterations |
| N | New |

## CHAPTER 5
## NONRESIDENTIAL MANDATORY MEASURES

### DIVISION 5.1 PLANNING AND DESIGN

### SECTION 5.101 GENERAL
**5.101.1 Scope**
The provisions of this chapter outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties.

### SECTION 5.102 DEFINITIONS
**5.102.1 DEFINITIONS**
The following terms are defined in Chapter 2 *(and are included here for reference)*

**CUTOFF LUMINAIRES.** Luminaires whose light distribution is such that the candela per 1000 lamp lumens does not numerically exceed 25 (2.5 percent) at an angle of 90 degrees above nadir, and 100 (10 percent) at a vertical angle of 80 degrees above nadir. This applies to all lateral angles around the luminaire.

**LOW-EMITTING AND FUEL EFFICIENT VEHICLES.**
Eligible vehicles are limited to the following:

1. Zero emission vehicle (ZEV), including neighborhood electric vehicles (NEV), partial zero emission vehicle (PZEV), advanced technology PZEV (AT ZEV) or CNG fueled (original equipment manufacturer only) regulated under Health and Safety Code section 43800 and CCR, Title 13, Sections 1961 and 1962.
2. High-efficiency vehicles, regulated by U.S. EPA, bearing High-Occupancy Vehicle (HOV) car pool lane stickers issued by the Department of Motor Vehicles.

**NEIGHBORHOOD ELECTRIC VEHICLE (NEV).** A motor vehicle that meets the definition of "low-speed vehicle" either in Section 385.5 of the Vehicle Code or in 49CFR571.500 (as it existed on July 1, 2000), and is certified to zero-emission vehicle standards.

**TENANT-OCCUPANTS.** Building occupants who inhabit a building during its normal hours of operation as permanent occupants, such as employees, as distinguished from customers and other transient visitors.

**VANPOOL VEHICLE.** Eligible vehicles are limited to any motor vehicle, other than a motortruck or truck tractor, designed for carrying more than 10 but not more than 15 persons including the driver, which is maintained and used primarily for the nonprofit work-related transportation of adults for the purpose of ridesharing.

**Note:** Source: Vehicle Code, Division 1, Section 668

**ZEV.** Any vehicle certified to zero-emission standards.

### SECTION 5.106 SITE DEVELOPMENT
**5.106.1 STORM WATER POLLUTION PREVENTION.** Newly constructed projects and additions which disturb less than one acre of land shall prevent the pollution of storm water runoff from the construction activities through one or more of the following measures:

**5.106.1.1 Local ordinance.** Comply with a lawfully enacted storm water management and/or erosion control ordinance.

**5.106.1.2 Best Management Practices (BMP).** Prevent the loss of soil through wind or water erosion by implementing an effective combination of erosion and sediment control and good housekeeping BMP.

1. Soil loss BMP that should be considered for each project include, but are not limited to, the following:
   a. Scheduling construction activity.
   b. Preservation of natural features, vegetation and soil.
   c. Drainage swales or lined ditches to control stormwater flow.
   d. Mulching or hydroseeding to stabilize disturbed soils.
   e. Erosion control to protect slopes.
   f. Protection of storm drain inlets (gravel bags or catch basin inserts).
   g. Perimeter sediment control (perimeter silt fence, fiber rolls).
   h. Sediment trap or sediment basin to retain sediment on site.
   i. Stabilized construction exits.
   j. Wind erosion control.
   k. Other soil loss BMP acceptable to the enforcing agency.
2. Good housekeeping BMP to manage construction equipment, materials and wastes that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
   a. Material handling and waste management.
   b. Building materials stockpile management.
   c. Management of washout areas (concrete, paints, stucco, etc.).
   d. Control of vehicle/equipment fueling to contractor's staging area.
   e. Vehicle and equipment cleaning performed off site.
   f. Spill prevention and control.
   g. Other housekeeping BMP acceptable to the enforcing agency.

INSPECTOR SIGNOFF

N/A

N/A

N/A

**5.106.4 BICYCLE PARKING.** For buildings within the authority of California Building Standards Commission as specified in Section 103, comply with Section 5.106.4.1. For buildings within the authority of the Division of the State Architect pursuant to Section 105, comply with Section 5.106.4.2

**5.106.4.1 Bicycle parking. [BSC-CG]** Comply with Sections 5.106.4.1.1 and 5.106.4.1.2; or meet the applicable local ordinance, whichever is stricter.

**5.106.4.1.1 Short-term bicycle parking.** If the project or an addition or alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5% of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack.
**Exception:** Additions or alterations which add nine or less visitor vehicular parking spaces.

**5.106.4.1.2 Long-term bicycle parking.** For new buildings with 10 or more tenant-occupants or for additions or alterations that add 10 or more tenant-occupants or for additions or alterations that add 10 or more tenant vehicular parking spaces, provide secure bicycle parking for 5 percent of the tenant vehicle parking spaces being added, with a minimum of one space. Acceptable parking facilities shall be convenient from the street and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

**Note:** Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates.

**5.106.4.2 Bicycle parking. [DSA-SS]** For public schools and community colleges, comply with Sections 5.106.4.2.1 and 5.106.4.2.2

**5.106.4.2.1 Student bicycle parking.** Provide permanently anchored bicycle racks conveniently accessed with a minimum of four two-bike capacity racks per new building.
**5.106.4.2.2 Staff bicycle parking.** Provide permanent, secure bicycle parking conveniently accessed with a minimum of two staff bicycle parking spaces per new building. Acceptable bicycle parking facilities shall be convenient from the street or staff parking area and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

**5.106.5.2 DESIGNATED PARKING FOR CLEAN AIR VEHICLES.** In new projects or additions or alterations that add 10 or more vehicular parking spaces, provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as follows:

TABLE 5.106.5.2 - PARKING

| TOTAL NUMBER OF PARKING SPACES | NUMBER OF REQUIRED SPACES |
|---|---|
| 0-9 | 0 |
| 10-25 | 1 |
| 25-50 | 3 |
| 51-75 | 6 |
| 76-100 | 8 |
| 101-150 | 11 |
| 151-200 | 16 |
| 201 AND OVER | AT LEAST 8% OF TOTAL |

**5.106.5.2.1 - Parking stall marking.** Paint, in the paint used for stall striping, the following characters such that the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle: CLEAN AIR / VAN POOL / EV

**Note:** Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces.

**5.106.5.3 Electric vehicle (EV) charging. [N]** Construction shall comply with Section 5.106.5.3.1 or Section 5.106.5.3.2 to facilitate future installation of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be in accordance with the *California Building Code*, the California Energy Commission (CEC) and as follows:

**5.106.5.3.1 Single charging space requirements. [N]** When only a single charging space is required per Table 5.106.5.3.3, a raceway is required to be installed at the time of construction and shall be installed in accordance with the *California Electrical Code*. Construction plans and specifications shall include, but are not limited to, the following:

1. The type and location of the EVSE.
2. A listed raceway capable of accommodating a 208/240 - volt dedicated branch circuit.
3. The raceway shall not be less than trade size 1.*
4. The raceway shall originate at a service panel or a subpanel serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and listed suitable cabinet, box, enclosure or equivalent.
5. The service panel or subpanel shall have sufficient capacity to accommodate a minimum 40-ampere dedicated branch circuit for the future installation of the EVSE.

**5.106.5.3.2 Multiple charging space requirements. [N]** When multiple charging spaces are required per Table 5.106.5.3.3 raceway(s) is/are required to be installed at the time of construction and shall be installed in accordance with the *California Electrical Code*. Construction plans and specifications shall include, but are not limited to, the following:

1. The type and location of the EVSE.
2. The raceway(s) shall originate at a service panel or a subpanel(s) serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into listed suitable cabinet(s), box(es), enclosure(s) or equivalent.
3. Plan design shall be based upon 40-ampere minimum branch circuits.
4. Electrical calculations shall substantiate the design of the electrical system, to include the rating of equipment and any on-site distribution transformers and have sufficient capacity to simultaneously charge all required EVs at its full rated amperage.
5. The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.

**5.106.5.3.3 EV charging space calculations. [N]** Table 5.106.5.3.3 shall be used to determine if single or multiple charging space requirements apply for the future installation of EVSE.

**Exceptions:** On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure is not feasible based upon one or more of the following conditions:

1. Where there is insufficient electrical supply.
2. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.

**NOTE: NO PARKING IS PART OF THIS SCOPE OF WORK**

INSPECTOR SIGNOFF

TABLE 5.106.5.3.3

| TOTAL NUMBER OF PARKING SPACES | NUMBER OF REQUIRED SPACES |
|---|---|
| 0-9 | 0 |
| 10-25 | 1 |
| 26-50 | 2 |
| 51-75 | 4 |
| 76-100 | 5 |
| 101-200 | 7 |
| 201 AND OVER | 6% of total[1] |

1. Calculation for spaces shall be rounded up to the nearest whole number.

**5.106.5.3.4 [N] Identification.** The service panel or subpanel(s) circuit directory shall identify the reserved overcurrent protective device space(s) for future EV charging as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE".

**5.106.5.3.5 [N]** Future charging spaces qualify as designated parking as described in Section 5.106.5.2 Designated parking for clean air vehicles.
**Notes:**

1. The California Department of Transportation adopts and publishes the California Manual on Uniform Traffic Control Devices (California MUTCD) to provide uniform standards and specifications for all official traffic control devices in California. Zero Emission Vehicle Signs and Pavement Markings can be found in the New Policies & Directives number 13-01. www.dot.ca.gov/hq/traffops/policy/13-01.pdf.
2. See Vehicle Code Section 22511 for EV charging spaces signage in off-street parking facilities and for use of EV charging spaces.
3. The Governor's Office of Planning and Research published a Zero-Emission Vehicle Community Readiness Guidebook which provides helpful information for local governments, residents and businesses. www.opr.ca.gov/docs/ZEV_Guidebook.pdf.

**5.106.8 LIGHT POLLUTION REDUCTION. [N]** Outdoor lighting systems shall be designed and installed to comply with the following:

1. The minimum requirements in the California Energy Code for Lighting Zones 1-4 as defined in Chapter 10 of the California Administrative Code; and
2. Backlight, Uplight and Glare (BUG) ratings as defined in IES TM-15-11; and
3. Allowable BUG ratings not exceeding those shown in Table 5.106.8, or Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.

**Exceptions: [N]**

1. Luminaires that qualify as exceptions in Section 140.7 of the California Energy Code.
2. Emergency lighting.
3. Building facade meeting the requirements in Table 140.7-B of the California Energy Code, Part 6.
4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 Alternate materials, designs and methods of construction.

**Note: [N]** See also California Building Code, Chapter 12, Section 1205.6 for college campus lighting requirements for parking facilities and walkways.

**5.106.10 GRADING AND PAVING.** Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales.
2. Water collection and disposal systems.
3. French drains.
4. Water retention gardens.
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.

**Exception:** Additions and alterations not altering the drainage path.

TABLE 5.106.8 [N] MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS [1,2]

| ALLOWABLE RATING | LIGHTING ZONE 1 | LIGHTING ZONE 2 | LIGHTING ZONE 3 | LIGHTING ZONE 4 |
|---|---|---|---|---|
| **MAXIMUM ALLOWABLE BACKLIGHT RATING [3]** | | | | |
| Luminaire greater than 2 mounting heights (MH) from property line | No Limit | No Limit | No Limit | No Limit |
| Luminaire back hemisphere is 1-2 MH from property line | B2 | B3 | B4 | B4 |
| Luminaire back hemisphere is 0.5-1 MH from property line | B1 | B2 | B3 | B3 |
| Luminaire back hemisphere is less than 0.5 MH from property line | B0 | B0 | B1 | B2 |
| **MAXIMUM ALLOWABLE UPLIGHT RATING** | | | | |
| For area lighting [4] | U0 | U0 | U0 | U0 |
| For all other outdoor lighting,including decorative luminaires | U1 | U2 | U3 | U4 |
| **MAXIMUM ALLOWABLE GLARE RATING [5]** | | | | |
| Luminaire greater than 2 MH from property line | G1 | G2 | G3 | G4 |
| Luminaire front hemisphere is 1-2 MH from property line | G0 | G1 | G1 | G2 |
| Luminaire front hemisphere is 0.5-1 MH from property line | G0 | G0 | G1 | G1 |
| Luminaire back hemisphere is less than 0.5 MH from property line | G0 | G0 | G0 | G1 |

1. IESNA Lighting Zones 0 and 5 are not applicable; refer to Lighting Zones as defined in the *California Energy Code* and Chapter 10 of the *California Administrative Code*.

2. For property lines that abut public walkways, bikeways, plazas and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.

3. If the nearest property line is less than or equal to two mounting heights from the back hemisphere of the luminaire distribution, the applicable reduced Backlight rating shall be met.

4. General lighting luminaires in areas such as outdoor parking, sales or storage lots shall meet these reduced ratings. Decorative luminaires located in these areas shall meet *U*-value limits for "all other outdoor lighting".

5. If the nearest property line is less than or equal to two mounting heights from the front hemisphere of the luminaire distribution, the applicable reduced Glare rating shall be met.

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N/A

N/A

### DIVISION 5.2 ENERGY EFFICIENCY

### SECTION 5.201 GENERAL
**5.201.1 Scope [BSC-CG].** *California Energy Code [DSA-SS].* For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory building standards.

### DIVISION 5.3 WATER EFFICIENCY AND CONSERVATION

### SECTION 5.301 GENERAL
**5.301.1 Scope.** The provisions of this chapter shall establish the means of conserving water use indoors, outdoors and in wastewater conveyance.

### SECTION 5.302 DEFINITIONS
**5.302.1 Definitions.** The following terms are defined in Chapter 2 *(and are included here for reference)*

**EVAPOTRANSPIRATION ADJUSTMENT FACTOR (ETAF) [DSA-SS].** An adjustment factor when applied to reference evapotranspiration that adjusts for plant factors and irrigation efficiency, which ae two major influences on the amount of water that needs to be applied to the landscape.

**FOOTPRINT AREA [DSA-SS].** The total area of the furthest exterior wall of the structure projected to natural grade, not including exterior areas such as stairs, covered walkways, patios and decks.

**METERING FAUCET.** A self-closing faucet that dispenses a specific volume of water for each actuation cycle. The volume or cycle duration can be fixed or adjustable.

**GRAYWATER.** Pursuant to Health and Safety Code Section 17922.12, "graywater" means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Graywater" includes, but is not limited to wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines and laundry tubs, but does not include waste water from kitchen sinks or dishwashers.

**MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO).** The California ordinance regulating landscape design, installation and maintenance practices that will ensure commercial, multifamily and other developer installed landscapes greater than 2500 square feet meet an irrigation water budget developed based on landscaped area and climatological parameters.

**MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO). [HCD]** The California model ordinance (California Code of Regulations, Title 23, Division 2, Chapter 2.7), regulating landscape design, installation and maintenance practices. Local agencies are required to adopt the updated MWELO, or adopt a local ordinance at least as effective as the MWELO.

**POTABLE WATER.** Water that is drinkable and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards. See definition in the California Plumbing Code, Part 5.

**POTABLE WATER. [HCD]** Water that is satisfactory for drinking, culinary, and domestic puroses, and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards and the requirements of the Health Authority Having Jurisdiction.

**RECYCLED WATER.** Water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur [Water Code Section 13050 (n)]. Simply put, recycled water is water treated to remove waste matter attaining a quality that is suitable to use the water again.

**SUBMETER.** A meter installed subordinate to a site meter. Usually used to measure water intended for one purpose, such as landscape irrigation. For the purposes of CALGreen, a dedicated meter may be considered a submeter.

**WATER BUDGET.** Is the estimated total landscape irrigation water use which shall not exceed the maximum applied water allowance calculated in accordance with the Department of Water Resources Model Efficient Landscape Ordinance (MWELO).

### SECTION 5.303 INDOOR WATER USE
**5.303.1 METERS.** Separate submeters or metering devices shall be installed for the uses described in Sections 503.1.1 and 503.1.2.

**5.303.1.1 Buildings in excess of 50,000 square feet.** Separate submeters shall be installed as follows:

1. For each individual leased, rented or other tenant space within the building projected to consume more than 100 gal/day (380 L/day), including, but not limited to, spaces used for laundry or cleaners, restaurant or food service, medical or dental office, laboratory, or beauty salon or barber shop.
2. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems:
   a. Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).
   b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).
   c. Steam and hot water boilers with energy input more than 500,000 Btu/h (147 kW).

**5.303.1.2 Excess consumption.** A separate submeter or metering device shall be provided for any tenant within a new building or within an addition that is projected to consume more than 1,000 gal/day.

**5.303.3 WATER CONSERVING PLUMBING FIXTURES AND FITTINGS.** Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:

**5.303.3.1 Water Closets.** The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-Type Toilets.

**Note:** The effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.

**5.303.3.2 Urinals.** The effective flush volume of urinals shall not exceed 0.5 gallons per flush.

**5.303.3.3 Showerheads.**
**5.303.3.3.1 Single showerhead.** Showerheads shall have a maximum flow rate of not more than 2.0 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

**5.303.3.3.2 Multiple showerheads serving one shower.** When a shower is served by more than one showerhead, the combined flow rate of all the showerheads and/or other shower outlets controlled by a single valve shall not exceed 2.0 gallons per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time.

Note: A hand-held shower shall be considered a showerhead.

**5.303.3.4 Faucets and fountains.**

**5.303.3.4.1 Nonresidential Lavatory faucets.** Lavatory faucets shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi.

**5.303.3.4.2 Kitchen faucets.** Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi.

**5.303.3.4.3 Wash fountains.** Wash fountains shall have a maximum flow rate of not more than1.8 gallons per minute/20 [rim space (inches) at 60 psi].

**5.303.3.4.4 Metering faucets.** Metering faucets shall not deliver more than 0.20 gallons per cycle.

**5.303.3.4.5 Metering faucets for wash fountains.** Metering faucets for wash fountains shall have a maximum flow rate of not more than 0.20 gallons per minute/20 [rim space (inches) at 60 psi].

**Note:** Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.

**5.303.4 COMMERCIAL KITCHEN EQUIPMENT.**

**5.303.4.1 Food Waste Disposers.** Disposers shall either modulate the use of water to no more than 1 gpm when the disposer is not in use (not actively grinding food waste/no-load) or shall automatically shut off after no more than 10 minutes of inactivity. Disposers shall use no more than 8 gpm of water.

**Note:** This code section does not affect local jurisdiction authority to prohibit or require disposer installation.

**5.303.5 AREAS OF ADDITION OR ALTERATION.** For those occupancies within the authority of the California Building Standards Commission as specified in Section 103, the provisions of Section 5.303.3 and 5.303.4 shall apply to new fixtures in additions or areas of alteration to the building.

**5.303.6 STANDARDS FOR PLUMBING FIXTURES AND FITTINGS.** Plumbing fixtures and fittings shall be installed in accordance with the *California Plumbing Code*, and shall meet the applicable standards referenced in Table 170.1 of the *California Plumbing Code* and in Chapter 6 of this code.

**NOTE: NO INDOOR WATER IS PART OF THIS SCOPE OF WORK**

**DISCLAIMER:** *THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE 2016 CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.*

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THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

**WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA**

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

| | |
|---|---|
| Project Arch. | ---- |
| CA REG. | ---- |
| PROJECT: | 12421-04 |

| ISSUE | DATE |
|---|---|
| SCHEMATIC DESIGN | 11/02/18 |
| BID SET | 3/25/2019 |
| 1 ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.
CALGREEN CHECKLIST

A0.3-1

# 2016 CALIFORNIA GREEN BUILDING STANDARDS CODE
## NONRESIDENTIAL MANDATORY MEASURES, SHEET 2 (INCLUDING JANUARY 1, 2017 ERRATA)

AIA|CC CALIFORNIA COUNCIL

INSPECTOR SIGNOFF

### SECTION 5.304 OUTDOOR WATER USE

**5.304.1 SCOPE.** The provisions of Section 5.304, Outdoor Water Use reference the mandatory Model Water Efficiency Landscape Ordinance (MWELO) contained within Chapter 2.7, Division 2, Title 23, California Code of Regulations.

**5.304.2 OUTDOOR WATER USE IN LANDSCAPE AREAS EQUAL TO OR GREATER THAN 500 SQUARE FEET.** When water is used for outdoor irrigation for new construction projects with an aggregate landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check or design review, one of the following shall apply:

1. A local water efficient landscape ordinance that is, based on evidence in the record, at least as effective in conserving water as the updated model ordinance adopted by the Department of Water Resouces (DWR) per Government Code Section 65595(c).
2. The California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) commencing with Section 490 of Chapter 2.7, Division 2, Title 23, California Code of Regulations.

**5.304.3 OUTDOOR WATER USE IN REHABILITATED LANDSCAPE PROJECTS EQUAL TO OR GREATER THAN 2,500 SQUARE FEET.** Rehabilitated landscape project with an aggregate landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review shall comply with Section 5.304.2, Item 1 or 2.

**5.304.4 OUTDOOR WATER USE IN LANDSCAPE AREAS OF 2,500 SQUARE FEET OR LESS.** Any project with an aggregate area of 2,500 square feet of less may comply with the performance requirements of MWELO or conform to the prescriptive compliance measures contained in MWELO's Appendix D.

**5.304.5 GRAYWATER OR RAINWATER USE IN LANDSCAPE AREAS.** For projects using treated or untreated graywater or rainwater captured on site, any lot or parcel within the project that has less than 2,500 square feet of landscape and meets the lot or parcel's landscape water requirement (Estimate Total Water Use) entirely with treated or untreated graywater or through stored rainwater captured on site is subject only to Appendix D Section (5).

Notes:
1. DWR's Model Water Efficient Landscape Ordinance, definitions and supporting documents are available at the following link: http://water.ca.gov/wateruseefficiency/landscapeordinance/
2. A water budget calculator is available at the following link: http://water.ca.gov/wateruseefficiency/landscapeordinance/
3. The MWELO prescriptive compliance measure Appendix D may be found at the following link: http://water.ca.gov/wateruseefficiency/landscapeordinance/ In addition, a copy of MWELO Appendix D may be found in Chapter 8 of this code.

**5.304.6 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS [DSA-SS].** For public schools and community colleges, landscape projects as described in Sections 5.304.6.1 and 5.304.6.2 shall comply with the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) commencing with Section 490 of Chapter 2.7, Division 2, Title 23, California Code of Regulations, except that the evapotranspiration adjustment factor (ETAF) shall be 0.65 with an additional water allowance for special landscape areas (SLA) of 0.35.

Exception: Any project with an aggregate landscape area of 2,500 square feet or less may comply with the prescriptive measures contained in Appendix D of MWELO.

**5.304.6.1 Newly constructed landscapes. [DSA-SS]** New construction projects with an aggregate landscape area equal to or greater than 500 square feet.

**5.304.6.2 Rehabilitated landscapes. [DSA-SS]** Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 1,200 square feet.

**5.304.3 IRRIGATION DESIGN.** In new nonresidential construction with at least 1,000 but not more than 2,500 square feet of cumulative landscaped area (the level at which the MWELO applies), install irrigation controllers and sensors which include the following criteria, and meet manufacturer's recommendations.

**5.304.3.1 Irrigation controllers.** Automatic irrigation system controllers installed at the time of final inspection shall comply with the following:

1. Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plants' needs as weather conditions change.
2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers are not required to have rain sensor input.

**Note:** More information regarding irrigation controller function and specifications is available from the Irrigation Association.

## DIVISION 5.4 MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

### SECTION 5.401 GENERAL

**5.401.1 SCOPE.** The provisions of this chapter shall outline means of achieving material conservation and resource efficiency through protection of buildings from exterior moisture, construction waste diversion, employment of techniques to reduce pollution through recycling of materials, and building commissioning or testing and adjusting.

### SECTION 5.402 DEFINITIONS

**5.402.1 DEFINITIONS.** The following terms are defined in Chapter 2 *(and are included here for reference)*

**ADJUST.** To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.

**BALANCE.** To proportion flows within the distribution system, including sub-mains, branches and terminals, according to design quantities.

**BUILDING COMMISSIONING.** A systematic quality assurance process that spans the entire design and construction process, including verifying and documenting that building systems and components are planned, designed, installed, tested, operated and maintained to meet the owner's project requirements.

**ORGANIC WASTE.** Food waste, green waste, landscape and pruning wste, nonhazardous wood waste, and food soiled paper waste that is mixed in with food waste.

**TEST.** A procedure to determine quantitative performance of a system or equipment

N/A

### SECTION 5.407 WATER RESISTANCE AND MOISTURE MANAGEMENT

**5.407.1 WEATHER PROTECTION.** Provide a weather-resistant exterior wall and foundation envelope as required by California Building Code Section 1403.2 (Weather Protection) and California Energy Code Section 150. (Mandatory Features and Devices), manufacturer's installation instructions or local ordinance, whichever is more stringent.

N/A

**5.407.2 MOISTURE CONTROL.** Employ moisture control measures by the following methods.

**5.407.2.1 Sprinklers.** Design and maintain landscape irrigation systems to prevent spray on structures.

**5.407.2.2 Entries and openings.** Design exterior entries and/or openings subject to foot traffic or wind-driven rain to prevent water intrusion into buildings as follows:

**5.407.2.2.1 Exterior door protection.** Primary exterior entries shall be covered to prevent water intrusion by using nonabsorbent floor and wall finishes within at least 2 feet around and perpendicular to such openings plus at least one of the following:

1. An installed awning at least 4 feet in depth.
2. The door is protected by a roof overhang at least 4 feet in depth.
3. The door is recessed at least 4 feet.
4. Other methods which provide equivalent protection.

**5.407.2.2.2 Flashing.** Install flashings integrated with a drainage plane.

### SECTION 5.408 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

**5.408.1 CONSTRUCTION WASTE MANAGEMENT.** Recycle and/or salvage for reuse a minimum of 65% of the non-hazardous construction and demolition waste in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.

**5.408.1.1 Construction waste management plan.** Where a local jurisdiction does not have a construction and demolition waste management ordinance, submit a construction waste management plan that:

1. Identifies the construction and demolition waste materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale.
2. Determines if construction and demolition waste materials will be sorted on-site (source-separated) or bulk mixed (single stream).
3. Identifies diversion facilities where construction and demolition waste material collected will be taken.
4. Specifies that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

**5.408.1.2 Waste Management Company.** Utilize a waste management company that can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with this section.

Note: The owner or contractor shall make the determination if the construction and demolition waste material will be diverted by a waste management company.

**Exceptions to Sections 5.408.1.1 and 5.408.1.2:**

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.
3. Demolition waste meeting local ordinance or calculated in consideration of loacl recycleing facilities and markets.

**5.408.1.3 Waste stream reduction alternative.** The combined weight of new construction disposal that does not exceed two pounds per square foot of building area may be deemed to meet the 65% minimum requirement as approved by the enforcing agency.

**5.408.1.4 Documentation.** Documentation shall be provided to the enforcing agency which demonstrates compliance with Sections 5.408.1.1, through 5.408.1.3. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the enforcing agency.

**Notes:**

1. Sample forms found in "A Guide to the California Green Building Standards Code (Nonresidential)" located at www.bsc.ca.gov/Home/CALGreen.aspx may be used to assist in documenting compliance with the waste management plan.
2. Mixed construction and demolition debris processors can be located at the California Department of Resources Recycling and Recovery (CalRecycle).

**5.408.2 UNIVERSAL WASTE. [A]** Additions and alterations to a building or tenant space that meet the scoping provisions in Section 301.3 for nonresidential additions and alterations, shall require verification that Universal Waste items such as fluorescent lamps and ballast and mercury containing thermostats as well as other California prohibited Universal Waste materials are disposed of properly and are diverted from landfills. A list of prohibited Universal Waste materials shall be included in the construction documents.

**Note**: Refer to the Universal Waste Rule link at: http://www.dtsc.ca.gov/LawsRegsPolicies/Regs/upload/OEAR-A_REGS_UWR_FinalText.pdf

**5.408.3 EXCAVATED SOIL AND LAND CLEARING DEBRIS.** 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed.

**Exception:** Reuse, either on or off-site, of vegetation or soil contaminated by disease or pest infestation.

**Notes:**

1. If contamination by disease or pest infestation is suspected, contact the County Agricultural Commissioner and follow its direction for recycling or disposal of the material.
2. For a map of know pest and/or disease quarantine zones, consult with the California Department of Food and Agriculture. (www.cdfa.ca.gov)

### SECTION 5.410 BUILDING MAINTENANCE AND OPERATIONS

**5.410.1 RECYCLING BY OCCUPANTS.** Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive.

**Exception:** Rural jurisdictions that meet and apply for the exemption in Public Resources Code 42649.82 (a)(2)(A) et seq. shall also be exempt from the organic waste portion of this section.

**5.410.1.1 Additions.** All additions conducted within a 12-month period under single or multiple permits, resulting in an increase of 30% or more in floor area, shall provide recycling areas on site.

**Exception:** Additions within a tenant space resulting in less than a 30% increase in the tenant space floor area.

**5.410.1.2 Sample ordinance.** Space allocation for recycling areas shall comply with Chapter 18, Part 3, Division 30 of the *Public Resources Code*. Chapter 18 is known as the California Solid Waste Reuse and Recycling Access Act of 1991 (Act).

**Note:** A sample ordinance for use by local agencies may be found in Appendix A of the document at the CalRecycle's web site.

N/A

**5.410.2 COMMISSIONING. [N]** For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. All occupancies other than I-occupancies and L-occupancies shall comply with the California Energy Code as prescribed in California Energy Code Section 120.8. For I-occupancies that are not regulated by OSHPD or for L-occupancies and L-occupancies that are not regulated by the California Energy Code Section 100.0 Scope, all requirements in Sections 5.410.2 through 5.410.2.6 shall apply.

Commissioning requirements shall include:

1. Owner's or Owner representative's project requirements.
2. Basis of design.
3. Commissioning measures shown in the construction documents.
4. Commissioning plan.
5. Functional performance testing.
6. Documentation and training.
7. Commissioning report.

**Exceptions:**

1. Unconditioned warehouses of any size.
2. Areas less than 10,000 square feet used for offices or other conditioned accessory spaces within unconditioned warehouses.
3. Tenant improvements less than 10,000 square feet as described in Section 303.1.1.
4. Open parking garages of any size, or open parking garage areas, of any size, within a structure.

**Note:** For the purposes of this section, unconditioned shall mean a building, area, or room which does not provide heating and or air conditioning.

**Informational Notes:**

1. IAS AC 476 is an accreditation criteria for organizations providing training and/or certification of commissioning personnel. AC 476 is available to the Authority Having Jurisdiction as a reference for qualifications of commissioning personnel. AC 476 des not certify individuals to conduct functional performance tests or to adjust and balance systems.
2. Functional performance testing for heating, ventilation, air conditioning systems and lighting controls must be performed in compliance with the *California Energy Code*.

**5.410.2.1 Owner's or Owner Representative's Project Requirements (OPR). [N]** The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. This documentation shall include the following:

1. Environmental and sustainability goals.
2. Energy efficiency goals.
3. Indoor environmental quality requirements.
4. Project program, including facility functions and hours of operation, and need for after hours operation.
5. Equipment and systems expectations.
6. Building occupant and operation and maintenance (O&M) personnel expectations.

**5.410.2.2 Basis of Design (BOD). [N]** A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project. The Basis of Design document shall cover the following systems:

1. Heating, ventilation, air conditioning (HVAC) systems and controls.
2. Indoor lighting system and controls.
3. Water heating system.
4. Renewable energy systems.
6. Water reuse systems.

**5.410.2.3 Commissioning plan. [N]** Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned. The commissioning plan shall include the following:

1. General project information.
2. Commissioning goals.
3. Systems to be commissioned. Plans to test systems and components shall include:
   a. An explanation of the original design intent.
   b. Equipment and systems to be tested, including the extent of tests.
   c. Functions to be tested.
   d. Conditions under which the test shall be performed.
   e. Measurable criteria for acceptable performance.
4. Commissioning team information.
5. Commissioning process activities, schedules and responsibilities. Plans for the completion of commissioning shall be included.

**5.410.2.4 Functional performance testing. [N]** Functional performance tests shall demonstrate the correct installation and operation of each component, system and system-to-system interface in accordance with the approved plans and specifications. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.

**5.410.2.5 Documentation and training. [N]** A Systems Manual and Systems Operations Training are required, including Occupational Safety and Health Act (OSHA) requirements in *California Code of Regulations* (CCR), Title 8, Section 5142, and other related regulations.

**5.410.2.5.1 Systems manual. [N]** Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner or representative. The systems manual shall include the following:

1. Site information, including facility description, history and current requirements.
2. Site contact information.
3. Basic operations and maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, site events log.
4. Major systems.
5. Site equipment inventory and maintenance notes.
6. A copy of verifications required by the enforcing agency or this code.
7. Other resources and documentation, if applicable.

**5.410.2.5.2 Systems operations training. [N]** A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and documented in the commissioning report and shall include the following:

1. System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces).
2. Review and demonstration of servicing/preventive maintenance.
3. Review of the information in the Systems Manual.
4. Review of the record drawings on the system/equipment.

**5.410.2.6 Commissioning report. [N]** A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or representative.

**5.410.4 TESTING AND ADJUSTING.** Testing and adjusting of systems shall be required for buildings less than 10,000 square feet or new systems to serve an addition or alteration subject to Section 303.1.

**5.410.4.2 Systems.** Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include at a minimum, as applicable to the project:

1. HVAC systems and controls.
2. Indoor and outdoor lighting and controls.
3. Water heating systems.
4. Renewable energy systems.
5. Landscape irrigation systems.
6. Water reuse systems.

**5.410.4.3 Procedures.** Perform testing and adjusting procedures in accordance with manufacturer's specifications and applicable standards on each system.

**5.410.4.3.1 HVAC balancing.** In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, the system shall be balanced in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; Associated Air Balance Council National Standards or as approved by the enforcing agency.

**5.410.4.4 Reporting.** After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

**5.410.4.5 Operation and maintenance (O & M) manual.** Provide the building owner or representative with detailed operating and maintenance instructions and copies of guaranties/warranties for each system. O & M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations.

**5.410.4.5.1 Inspections and reports.** Include a copy of all inspection verifications and reports required by the enforcing agency.

## DIVISION 5.5 ENVIRONMENTAL QUALITY

### SECTION 5.501 GENERAL

**5.501.1 SCOPE.** The provisions of this chapter shall outline means of reducing the quantity of air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of a building's installers, occupants and neighbors.

### SECTION 5.502 DEFINITIONS

**5.502.1 DEFINITIONS.** The following terms are defined in Chapter 2 *(and are included here for reference)*

**ARTERIAL HIGHWAY.** A general term denoting a highway primarily for through traffic usually on a continuous route.

**A-WEIGHTED SOUND LEVEL (dBA).** The sound pressure level in decibels as measured on a sound level meter using the Internationally standardized A-weighting filter or as computed from sound spectral data to which A-weighting adjustments have been made.

**1 BTU/HOUR.** British thermal units per hour, also referred to as Btu. The amount of heat required to raise one pound of water one degree Fahrenheit per hour, a common measure of heat transfer rate. A ton of refrigeration is 12,000 Btu, the amount of heat required to melt a ton (2,000 pounds) of ice at 32$^{0}$ Fahrenheit.

**COMMUNITY NOISE EQUIVALENT LEVEL (CNEL).** A metric similar to the day-night average sound level (Ldn), except that a 5 decibel adjustment is added to the equivalent continuous sound exposure level for evening hours (7pm to 10pm) in addition to the 10 dB nighttime adjustment used in the Ldn.

**COMPOSITE WOOD PRODUCTS.** Composite wood products include hardwood plywood, particleboard and medium density fiberboard. "Composite wood products" does not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber, timber, prefabricated wood I–joists or finger–jointed lumber, all as specified in California Code of Regulations (CCR), Title 17, Section 93120.1(a).

**Note:** See CCR, Title 17, Section 93120.1.

**DAY-NIGHT AVERAGE SOUND LEVEL (Ldn).** The A-weighted equivalent continuous sound exposure level for a 24-hour period with a 10 dB adjustment added to sound levels occurring during nighttime hours (10p.m. to 7 a.m.).

**DECIBEL (db).** A measure on a logarithmic scale of the magnitude of a particular quantity (such as sound pressure, sound power, sound intensity) with respect to a reference quantity.

**ELECTRIC VEHICLE (EV).** An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current. Plug-in hybrid electric vehicles (PHEV) are considered electric vehicles. For purposes of the *California Electrical Code*, off-road, self-propelled electric vehicles, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats, and the like, are not included.

**ELECTRIC VEHICLE CHARGING STATION(S) (EVCS).** One or more spaces intended for charging electric vehicles.

**ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE).** The conductors, including the ungrounded, grounded, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.

**ENERGY EQUIVALENT (NOISE) LEVEL (Leq).** The level of a steady noise which would have the same energy as the fluctuating noise level integrated over the time of period of interest.

**EXPRESSWAY.** An arterial highway for through traffic which may have partial control of access, but which may or may not be divided or have grade separations at intersections.

**FREEWAY.** A divided arterial highway with full control of access and with grade separations at intersections.

**GLOBAL WARMING POTENTIAL (GWP).** The radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of carbon dioxide over a given period of time. Carbon dioxide is the reference compound with a GWP of one.

**GLOBAL WARMING POTENTIAL VALUE (GWP VALUE).** A 100-year GWP value published by the Intergovernmental Panel on Climate Change (IPCC) in either its Second Assessment Report (SAR) (IPCC, 1995); or its Fourth Assessment A-3 Report (AR4) (IPCC, 2007). The SAR GWP values are found in column "SAR (100-yr)" of Table 2.14.; the AR4 GWP values are found in column "100 yr" of Table 2.14.

**HIGH-GWP REFRIGERANT.** A compound used as a heat transfer fluid or gas that is: (a) a chlorofluorocarbon, a hdrochlorofluorocarbon, a hydrofluorocarbon, a perfluorocarbon, or any compound or blend of compounds, with a GWP value equal to or greater than 150, or (B) any ozone depleting substance as defined in Title 40 of the Code of Federal Regulations, Part 82, sec.82.3 (as amended March 10, 2009).

**LONG RADIUS ELBOW.** Pipe fitting installed between two lengths of pipe or tubing to allow a change of direction, with a radius 1.5 times the pipe diameter.

**LOW-GWP REFRIGERANT.** A compound used as a heat transfer fluid or gas that: (A) has a GWP value less than 150, and (B) is not an ozone depleting substance as defined in Title 40 of the Code of Federal Regulations, Part 82, sec.82.3 (as amended March 10, 2009).

**MERV.** Filter minimum efficiency reporting value, based on ASHRAE 52.2–1999.

**MAXIMUM INCREMENTAL REACTIVITY (MIR).** The maximum change in weight of ozone formed by adding a compound to the "Base REactive Organic Gas (ROG) Mixture" per weight of compound added, expressed to hundreths of a gram (g $O^{3}$/g ROC).

**PRODUCT-WEIGHTED MIR (PWMIR).** The sum of all weighted-MIR for all ingredients in a product subject to this article. The PWMIR is the total product reactivity expressed to hundredths of a gram of ozone formed per gram of product (excluding container and packaging).

**PSIG.** Pounds per square inch, guage.

**REACTIVE ORGANIC COMPOUND (ROC).** Any compound that has the potential, once emitted, to contribute to ozone formation in the troposphere.

**SCHRADER ACCESS VALVES.** Access fittings with a valve core installed.

**SHORT RADIUS ELBOW.** Pipe fitting installed between two lengths of pipe or tubing to allow a change of direction, with a radius 1.0 times the pipe diameter.

**SUPERMARKET.** For the purposes of Section 5.508.2, a supermarket is any retail food facility with 8,000 square feet or more conditioned area, and that utilizes either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units.

**VOC.** A volatile organic compound broadly defined as a chemical compound based on carbon chains or rings with vapor pressures greater than 0.1 millimeters of mercury at room temperature. These compounds typically contain hydrogen and may contain oxygen, nitrogen and other elements. See CCR Title 17, Section 94508(a)

.

**Note:** Where specific regulations are cited from different agencies such as SCAQMD, ARB, etc., the VOC definition included in that specific regulation is the one that prevails for the specific measure in question.

### SECTION 5.503 FIREPLACES

N/A

**5.503.1 FIREPLACES.** Install only a direct-vent sealed-combustion gas or sealed wood-burning fireplace, or a sealed woodstove or pellet stove, and refer to residential requirements in the California Energy Code, Title 24, Part 6, Subchapter 7, Section 150. Woodstoves, pellet stoves and fireplaces shall comply with applicable local ordinances.

**5.503.1.1 Woodstoves.** Woodstoves and pellet stoves shall comply with U.S. EPA New Source Performance Standards (NSPS) emission limits as applicable, and shall have a permanent label indicating they are certified to meet the emission limits.

### SECTION 5.504 POLLUTANT CONTROL

N/A

**5.504.1 TEMPORARY VENTILATION.** The permanent HVAC system shall only be used during construction if necessary to condition the building or areas of addition or alteration within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30% based on ASHRAE 52.1-1992. Replace all filters immediately prior to occupancy, or, if the building is occupied during alteration, at the conclusion of construction.

N/A

**5.504.3 Covering of duct openings and protection of mechanical equipment during construction.** At the time of rough installation, or during storage on the construction site and until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may collect in the system.

**DISCLAIMER:** *THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE 2016 CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.*

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THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

**WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA**

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

| | |
|---|---|
| Project Arch. | ---- |
| CA REG. | ---- |
| PROJECT: | 12421-04 |

| ISSUE | DATE |
|---|---|
| SCHEMATIC DESIGN | 11/02/18 |
| BID SET | 3/25/2019 |
| 1 ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.
CALGREEN CHECKLIST

1A

A0.3-2

# 2016 CALIFORNIA GREEN BUILDING STANDARDS CODE
## NONRESIDENTIAL MANDATORY MEASURES, SHEET 3 (INCLUDING JANUARY 1, 2017 ERRATA)

AIA|CC CALIFORNIA COUNCIL

INSPECTOR SIGNOFF

**5.504.4 FINISH MATERIAL POLLUTANT CONTROL.** Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.6.

**5.504.4.1 Adhesives, sealants and caulks.** Adhesives, sealants, and caulks used on the project shall meet the requirements of the following standards:

1. Adhesives, adhesive bonding primers adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.

2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of *California Code of Regulations*, Title 17, commencing with Section 94507.

TABLE 5.504.4.1 - ADHESIVE VOC LIMIT[1,2]

Less Water and Less Exempt Compounds in Grams per Liter

| ARCHITECTURAL APPLICATIONS | CURRENT VOC LIMIT |
|---|---|
| INDOOR CARPET ADHESIVES | 50 |
| CARPET PAD ADHESIVES | 50 |
| OUTDOOR CARPET ADHESIVES | 150 |
| WOOD FLOORING ADHESIVES | 100 |
| RUBBER FLOOR ADHESIVES | 60 |
| SUBFLOOR ADHESIVES | 50 |
| CERAMIC TILE ADHESIVES | 65 |
| VCT & ASPHALT TILE ADHESIVES | 50 |
| DRYWALL & PANEL ADHESIVES | 50 |
| COVE BASE ADHESIVES | 50 |
| MULTIPURPOSE CONSTRUCTION ADHESIVES | 70 |
| STRUCTURAL GLAZING ADHESIVES | 100 |
| SINGLE-PLY ROOF MEMBRANE ADHESIVES | 250 |
| OTHER ADHESIVES NOT SPECIFICALLY LISTED | 50 |
| **SPECIALTY APPLICATIONS** | |
| PVC WELDING | 510 |
| CPVC WELDING | 490 |
| ABS WELDING | 325 |
| PLASTIC CEMENT WELDING | 250 |
| ADHESIVE PRIMER FOR PLASTIC | 550 |
| CONTACT ADHESIVE | 80 |
| SPECIAL PURPOSE CONTACT ADHESIVE | 250 |
| STRUCTURAL WOOD MEMBER ADHESIVE | 140 |
| TOP & TRIM ADHESIVE | 250 |
| **SUBSTRATE SPECIFIC APPLICATIONS** | |
| METAL TO METAL | 30 |
| PLASTIC FOAMS | 50 |
| POROUS MATERIAL (EXCEPT WOOD) | 50 |
| WOOD | 30 |
| FIBERGLASS | 80 |

1. IF AN ADHESIVE IS USED TO BOND DISSIMILAR SUBSTRATES TOGETHER, THE ADHESIVE WITH THE HIGHEST VOC CONTENT SHALL BE ALLOWED.

2. FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THIS TABLE, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168, www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF

TABLE 5.504.4.2 - SEALANT VOC LIMIT

Less Water and Less Exempt Compounds in Grams per Liter

| SEALANTS | CURRENT VOC LIMIT |
|---|---|
| ARCHITECTURAL | 250 |
| MARINE DECK | 760 |
| NONMEMBRANE ROOF | 300 |
| ROADWAY | 250 |
| SINGLE-PLY ROOF MEMBRANE | 450 |
| OTHER | 420 |
| **SEALANT PRIMERS** | |
| ARCHITECTURAL | |
| NONPOROUS | 250 |
| POROUS | 775 |
| MODIFIED BITUMINOUS | 500 |
| MARINE DECK | 760 |
| OTHER | 750 |

NOTE: FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THESE TABLES, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168.

**5.504.4.3 Paints and coatings.** Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 5.504.4.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-High Gloss coating, based on its gloss, as defined in Subsections 4.21, 4.36 and 4.37 of the 2007 California Air Resources Board Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 5.504.4.3 shall apply.

**5.504.4.3.1 Aerosol Paints and coatings.** Aerosol paints and coatings shall meet the PWMIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of *California Code of Regulations*, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.

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TABLE 5.504.4.3 - VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[2,3]

GRAMS OF VOC PER LITER OF COATING, LESS WATER & LESS EXEMPT COMPOUNDS

| COATING CATEGORY | CURRENT VOC LIMIT |
|---|---|
| FLAT COATINGS | 50 |
| NONFLAT COATINGS | 100 |
| NONFLAT HIGH GLOSS COATINGS | 150 |
| **SPECIALTY COATINGS** | |
| ALUMINUM ROOF COATINGS | 400 |
| BASEMENT SPECIALTY COATINGS | 400 |
| BITUMINOUS ROOF COATINGS | 50 |
| BITUMINOUS ROOF PRIMERS | 350 |
| BOND BREAKERS | 350 |
| CONCRETE CURING COMPOUNDS | 350 |
| CONCRETE/MASONRY SEALERS | 100 |
| DRIVEWAY SEALERS | 50 |
| DRY FOG COATINGS | 150 |
| FAUX FINISHING COATINGS | 350 |
| FIRE RESISTIVE COATINGS | 350 |
| FLOOR COATINGS | 100 |
| FORM-RELEASE COMPOUNDS | 250 |
| GRAPHIC ARTS COATINGS (SIGN PAINTS) | 500 |
| HIGH-TEMPERATURE COATINGS | 420 |
| INDUSTRIAL MAINTENANCE COATINGS | 250 |
| LOW SOLIDS COATINGS[1] | 120 |
| MAGNESITE CEMENT COATINGS | 450 |
| MASTIC TEXTURE COATINGS | 100 |
| METALLIC PIGMENTED COATINGS | 500 |
| MULTICOLOR COATINGS | 250 |
| PRETREATMENT WASH PRIMERS | 420 |
| PRIMERS, SEALERS, & UNDERCOATERS | 100 |
| REACTIVE PENETRATING SEALERS | 350 |
| RECYCLED COATINGS | 250 |
| ROOF COATINGS | 50 |
| RUST PREVENTATIVE COATINGS | 250 |
| SHELLACS: | |
| CLEAR | 730 |
| OPAQUE | 550 |
| SPECIALTY PRIMERS, SEALERS & UNDERCOATERS | 100 |
| STAINS | 250 |
| STONE CONSOLIDANTS | 450 |
| SWIMMING POOL COATINGS | 340 |
| TRAFFIC MARKING COATINGS | 100 |
| TUB & TILE REFINISH COATINGS | 420 |
| WATERPROOFING MEMBRANES | 250 |
| WOOD COATINGS | 275 |
| WOOD PRESERVATIVES | 350 |
| ZINC-RICH PRIMERS | 340 |

1. GRAMS OF VOC PER LITER OF COATING, INCLUDING WATER & EXEMPT COMPOUNDS

2. THE SPECIFIED LIMITS REMAIN IN EFFECT UNLESS REVISED LIMITS ARE LISTED IN SUBSEQUENT COLUMNS IN THE TABLE.

3. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, ARCHITECTURAL COATINGS SUGGESTED CONTROL MEASURE, FEB. 1, 2008. MORE INFORMATION IS AVAILABLE FROM THE AIR RESOURCES BOARD.

**5.504.4.3.2 Verification.** Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:

1. Manufacturer's product specification
2. Field verification of on-site product containers

N/A

**5.504.4.4 Carpet Systems.** All carpet installed in the building interior shall meet at least one of the testing and product requirements:

1. Carpet and Rug Institute's Green Label Plus Program.
2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health's Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.1, February 2010 (also known as CDPH Standard Method V1.1 or Specification 01350).
3. NSF/ANSI 140 at the Gold level or higher.
4. Scientific Certifications Systems Sustainable Choice; or
5. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database.

**5.504.4.4.1 Carpet cushion.** All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program.

**5.504.4.4.2 Carpet adhesive.** All carpet adhesive shall meet the requirements of Table 5.504.4.1.

**5.504.4.5 Composite wood products.** Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the buildings shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.). Those materials not exempted under the ATCM must meet the specified emission limits, as shown in Table 5.504.4.5.

**5.504.4.5.3 Documentation.** Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:

1. Product certifications and specifications.
2. Chain of custody certifications.
3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).
4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards.
5. Other methods acceptable to the enforcing agency.

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TABLE 5.504.4.5 - FORMALDEHYDE LIMITS[1]

MAXIMUM FORMALDEHYDE EMISSIONS IN PARTS PER MILLION

| PRODUCT | CURRENT LIMIT |
|---|---|
| HARDWOOD PLYWOOD VENEER CORE | 0.05 |
| HARDWOOD PLYWOOD COMPOSITE CORE | 0.05 |
| PARTICLE BOARD | 0.09 |
| MEDIUM DENSITY FIBERBOARD | 0.11 |
| THIN MEDIUM DENSITY FIBERBOARD[2] | 0.13 |

1. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, AIR TOXICS CONTROL MEASURE FOR COMPOSITE WOOD AS TESTED IN ACCORDANCE WITH ASTM E 1333. FOR ADDITIONAL INFORMATION, SEE CALIFORNIA CODE OF REGULATIONS, TITLE 17, SECTIONS 93120 THROUGH 93120.12.

2. THIN MEDIUM DENSITY FIBERBOARD HAS A MAXIMUM THICKNESS OF 5/16 INCHES (8 MM).

N/A

**5.504.4.6 Resilient flooring systems.** For 80 percent of floor area receiving resilient flooring, installed resilient flooring shall meet at least one of the following:

1. Certified under the Resilient Floor Covering Institute (RFCI) FloorScore program;
2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health's 2010 Standard Method for the Testing and Evaluation Chambers, Version 1.1, February 2010;
3. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; or
4. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children's & Schools Program).

**5.504.4.6.1 Verification of compliance.** Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.

N/A

**5.504.5.3 Filters.** In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a Minimum Efficiency Reporting Value (MERV) of 8. MERV 8 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual.

**Exceptions:**

1. An ASHRAE 10% to 15% efficiency filter shall be permitted for an HVAC unit meeting the 2013 California Energy Code having 60,000 Btu/h or less capacity per fan coil, if the energy use of the air delivery system is 0.4 W/cfm or less at design air flow.
2. Existing mechanical equipment.

**5.504.7 ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL.** Where outdoor areas are provided for smoking, prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows and within the building as already prohibited by other laws or regulations; or as enforced by ordinances, regulations or policies of any city, county, city and county, California Community College, campus of the California State University, or campus of the University of California, whichever are more stringent. When ordinances, regulations or policies are not in place, post signage to inform building occupants of the prohibitions.

## SECTION 5.505 INDOOR MOISTURE CONTROL

**5.505.1 INDOOR MOISTURE CONTROL.** Buildings shall meet or exceed the provisions of *California Building Code*, CCR, Title 24, Part 2, Sections 1203 (Ventilation) and Chapter 14 (Exterior Walls). For additional measures not applicable to low-rise residential occupancies, see Section 5.407.2 of this code.

## SECTION 5.506 INDOOR AIR QUALITY

**5.506.1 OUTSIDE AIR DELIVERY.** For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 (Requirements For Ventilation) of the *California Energy Code*, or the applicable local code, whichever is more stringent, and Division 1, Chapter 4 of CCR, Title 8.

**5.506.2 CARBON DIOXIDE ($CO_2$) MONITORING.** For buildings or additions equipped with demand control ventilation, $CO_2$ sensors and ventilation controls shall be specified and installed in accordance with the requirements of the California Energy Code, Section 120(c)(4).

## SECTION 5.507 ENVIRONMENTAL COMFORT

**5.507.4 ACOUSTICAL CONTROL.** Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with ASTM E 90 and ASTM E 413, or Outdoor-Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E 1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.

**Exception:** Buildings with few or no occupants or where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures and utility buildings.

**Exception: [DSA-SS]** For public schools and community colleges, the requirements of this section and all subsections apply only to new construction.

**5.507.4.1 Exterior noise transmission, prescriptive method.** Wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 in the following locations:

1. Within the 65 CNEL noise contour of an airport.

**Exceptions:**

a. $L_{dn}$ or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.
b. $L_{dn}$ or CNEL for other airports and heliports for which a land use plan has not been developed shall be determined by the local general plan noise element.

2. Within the 65 CNEL or $L_{dn}$ noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway source as determined by the Noise Element of the General Plan.

**5.507.4.1.1. Noise exposure where noise contours are not readily available.** Buildings exposed to a noise level of 65 dB $L_{eq}$ - 1-hr during any hour of operation shall have building, addition or alteration exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30).

**5.507.4.2 Performance Method.** For buildings located as defined in Section 5.507.4.1 or 5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (Leq-1Hr) of 50 dBA in occupied areas during any hour of operation.

**5.507.4.2.1 Site Features.** Exterior features such as sound walls or earth berms may be utilized as appropriate to the building, addition or alteration project to mitigate sound migration to the interior.

**5.507.4.2.2 Documentation of Compliance.** An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

**5.507.4.3 Interior sound transmission.** Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.

**Note:** Examples of assemblies and their various STC ratings may be found at the California Office of Noise Control: www.toolbase.org/PDF/CaseStudies/stc_icc_ratings.pdf.

## SECTION 5.508 OUTDOOR AIR QUALITY

**5.508.1 Ozone depletion and greenhouse gas reductions.** Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2.

**5.508.1.1 Chlorofluorocarbons (CFCs).** Install HVAC, refrigeration and fire suppression equipment that do not contain CFCs.

**5.508.1.2 Halons.** Install HVAC, refrigeration and fire suppression equipment that do not contain Halons.

**5.508.2 Supermarket refrigerant leak reduction.** New commercial refrigeration systems shall comply with the provisions of this section when installed in retail food stores 8,000 square feet or more conditioned area, and that utilize either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units. The leak reduction measures apply to refrigeration systems containing high-global-warming potential (high-GWP) refrigerants with a GWP of 150 or greater. New refrigeration systems include both new facilities and the replacement of existing refrigeration systems in existing facilities.

INSPECTOR SIGNOFF

**Exception:** Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are nonozone-depleting refrigerants that include ammonia, carbon dioxide ($CO_2$), and potentially other refrigerants.

**5.508.2.1 Refrigerant piping.** Piping compliant with the California Mechanical Code shall be installed to be accessible for leak protection and repairs. Piping runs using threaded pipe, copper tubing with an outside diameter (OD) less than 1/4 inch, flared tubing connections and short radius elbows shall not be used in refrigerant systems except as noted below.

**5.508.2.1.1 Threaded pipe.** Threaded connections are permitted at the compressor rack.

**5.508.2.1.2 Copper pipe.** Copper tubing with an OD less than 1/4 inch may be used in systems with a refrigerant charge of 5 pounds or less.

**5.508.2.1.3.1 Anchorage.** One-fouth-inch OD tubing shall be securely clamped to a rigid base to keep vibration levels below 8 mils.

**5.508.2.1.3 Flared tubing connections.** Double-flared tubing connections may be used for pressure controls, valve pilot lines and oil.

**Exception:** Single-flared tubing connections may be used with a multiring seal coated with industrial sealant suitable for use with refrigerants and tightened in accordance with manufacturer's recommendations.

**5.508.2.1.4 Elbows.** Short radius elbows are only permitted where space limitations prohibit use of long radius elbows.

**5.508.2.2 Valves.** Valves Valves and fittings shall comply with the *California Mechanical Code* and as follows.

**5.508.2.2.1 Pressure relief valves.** For vessels containing high-GWP refrigerant, a rupture disc shall be installed between the outlet of the vessel and the inlet of the pressure relief valve.

**5.508.2.2.1.1 Pressure detection.** A pressure gauge, pressure transducer or other device shall be installed in the space between the rupture disc and the relief valve inlet to indicate a disc rupture or discharge of the relief valve.

**5.508.2.2.2 Access valves.** Only Schrader access valves with a brass or steel body are permitted for use.

**5.508.2.2.2.1 Valve caps.** For systems with a refrigerant charge of 5 pounds or more, valve caps shall be brass or steel and not plastic.

**5.508.2.2.2.2 Seal caps.** If designed for it, the cap shall have a neoprene O-ring in place.

**5.508.2.2.2.2.1 Chain tethers.** Chain tethers to fit over the stem are required for valves designed to have seal caps.

**Exception:** Valves with seal caps that are not removed from the valve during stem operation.

**5.508.2.3 Refrigerated service cases.** Refrigerated service cases holding food products containing vinegar and salt shall have evaporator coils of corrosion-resistant material, such as stainless steel; or be coated to prevent corrosion from these substances.

**5.508.2.3.1 Coil coating.** Consideration shall be given to the heat transfer efficiency of coil coating to maximize energy efficiency.

**5.508.2.4 Refrigerant receivers.** Refrigerant receivers with capacities greater than 200 pounds shall be fitted with a device tha indicates the level of refrigerant in the receiver.

**5.508.2.5 Pressure testing.** The system shall be pressure tested during installation prior to evacuation and charging.

**5.508.2.5.1 Minimum pressure.** The system shall be charged with regulated dry nitrogen and appropriate tracer gas to bring system pressure up to 300 psig minimum.

**5.508.2.5.2 Leaks.** Check the system for leaks, repair any leaks, and retest for pressure using the same gauge.

**5.508.2.5.3 Allowable pressure change.** The system shall stand, unaltered, for 24 hours with no more than a +/- one pound pressure change from 300 psig, measured with the same gauge.

**5.508.2.6 Evacuation.** The system shall be evacuated after pressure testing and prior to charging.

**5.508.2.6.1 First vacuum.** Pull a system vacuum down to at least 1000 microns (+/- 50 microns), and hold for 30 minutes.

**5.508.2.6.2 Second vacuum.** Pull a second system vacuum to a minimum of 500 microns and hold for 30 minutes.

**5.508.2.6.3 Third vacuum.** Pull a third vacuum down to a minimum of 300 microns, and hold for 24 hours with a maximum drift of 100 microns over a 24-hour period.

## CHAPTER 7
## INSTALLER & SPECIAL INSPECTOR QUALIFICATIONS

### 702 QUALIFICATIONS

**702.1 INSTALLER TRAINING.** HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or contractor licensed to install HVAC systems. Examples of acceptable HVAC training and certification programs include but are not limited to the following:

1. State certified apprenticeship programs.
2. Public utility training programs.
3. Training programs sponsored by trade, labor or statewide energy consulting or verification organizations.
4. Programs sponsored by manufacturing organizations.
5. Other programs acceptable to the enforcing agency.

**702.2 SPECIAL INSPECTION [HCD].** When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education may be considered by the enforcing agency when evaluating the qualifications of a special inspector:

1. Certification by a national or regional green building program or standard publisher.
2. Certification by a statewide energy consulting or verification organization, such as HERS raters, building performance contractors, and home energy auditors.
3. Successful completion of a third party apprentice training program in the appropriate trade.
4. Other programs acceptable to the enforcing agency.

**Notes:**

1. Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.
2. HERS raters are special inspectors certified by the California Energy Commission (CEC) to rate homes in California according to the Home Energy Rating System (HERS).

**[BSC-CG]** When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The area of certification shall be closely related to the primary job function, as determined by the local agency.

**Note:** Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.

## 703 VERIFICATIONS

**703.1 DOCUMENTATION.** Documentation used to show compliance with this code shall include but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which demonstrate substantial conformance. When specific documentation or special inspection is necessary to verify compliance, that method of compliance will be specified in the appropriate section or identified applicable checklist.

**DISCLAIMER:** *THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE 2016 CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.*

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WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA

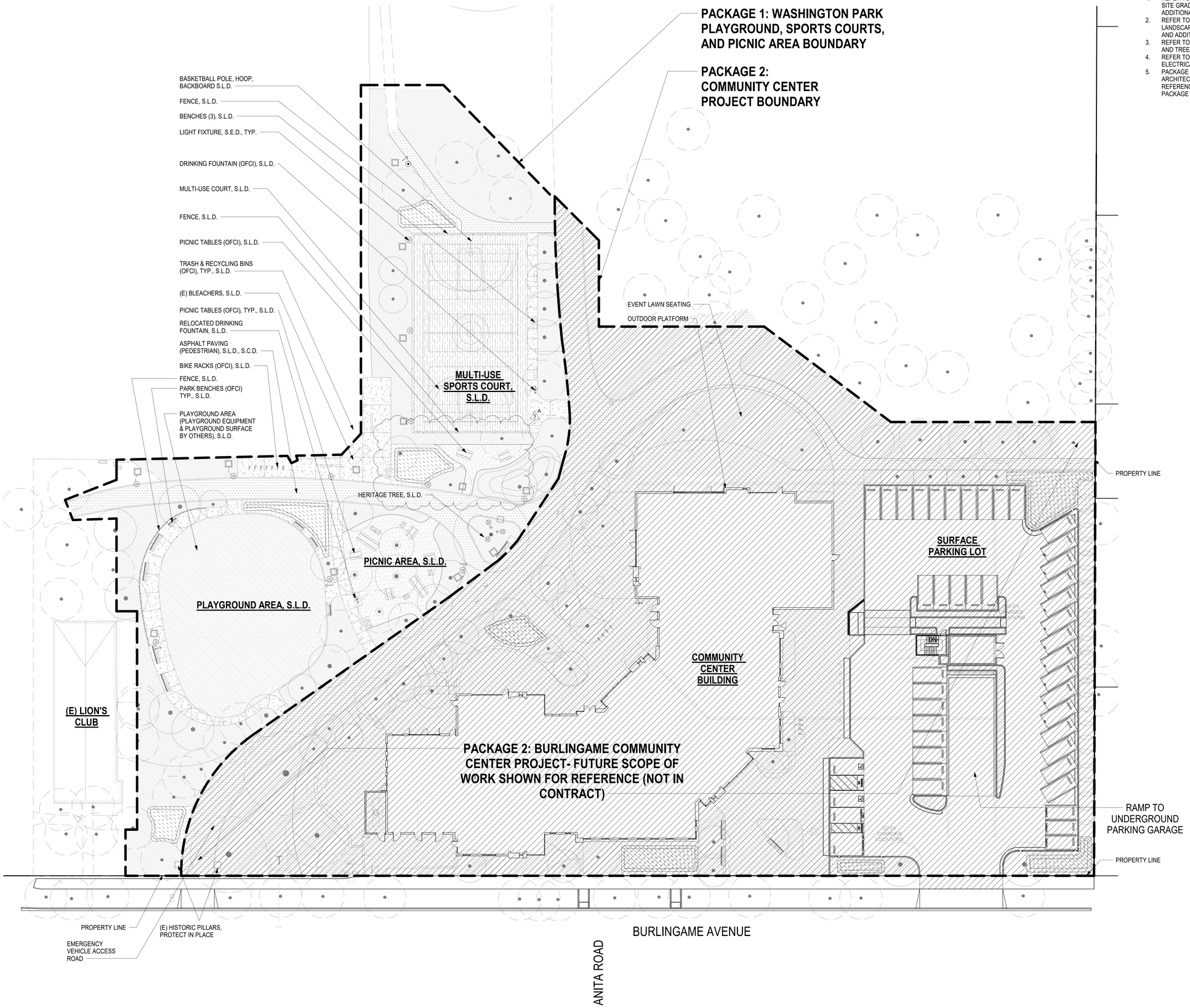
850 BURLINGAME AVE
BURLINGAME
CA 94010

Project Arch. ----
CA REG. ----
PROJECT: 12421-04

| ISSUE | DATE |
|---|---|
| SCHEMATIC DESIGN | 11/02/18 |
| BID SET | 3/25/2019 |
| 1A ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.
CALGREEN CHECKLIST

_A0.3-3




1 SP- SITE PLAN (PACKAGE 1)
1" = 20'-0"

## SHEET NOTES

1. REFER TO CIVIL FOR HORIZONTAL CONTROLS, SITE GRADING, UTILITY LOCATIONS AND ADDITIONAL SITE INFORMATION.
2. REFER TO LANDSCAPE FOR SITE FURNISHINGS, LANDSCAPE LAYOUT, PLANTING, IRRIGATION AND ADDITIONAL SITE INFORMATION.
3. REFER TO LANDSCAPE FOR TREE REMOVAL AND TREE PROTECTION PLAN
4. REFER TO ELECTRICAL FOR SITE LIGHTING AND ELECTRICAL INFORMATION
5. PACKAGE 2 SCOPE OF WORK SHOWN ON THIS ARCHITECTURAL SITE PLAN IS SHOWN FOR REFERENCE ONLY AND SHOWS PROPOSED PACKAGE 2 PROJECT SCOPE.

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# WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA

**850 BURLINGAME AVE**
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| SCHEMATIC DESIGN | 11/02/18 |
| BID SET | 3/25/2019 |
| 1 ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.
SITE PLAN

A1.1-0

## GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THESE PLANS, SPECIAL PROVISIONS, THE CITY OF BURLINGAME DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS, AND CALTRANS STANDARD PLANS AND SPECIFICATIONS DATED 2010.
2. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD THE OWNER AND FREYER & LAURETA, INC. HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH PERFORMANCE OF WORK ON THE PROJECT.
3. IT SHALL BE THE REASONABILITY OF THE CONTRACTOR TO COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES AND TO OBTAIN ANY PERMITS REQUIRED BY THE CITY OF BURLINGAME AND OTHER AGENCIES IN ORDER TO DO THE WORK SHOWN ON THESE PLANS.
4. THE CITY ENGINEER SHALL BE NOTIFIED IN WRITING FIVE (5) DAYS PRIOR TO COMMENCING CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL GIVE THE CITY OF BURLINGAME ENGINEERING DEPARTMENT AT LEASE THREE (3) WORKING DAYS ADVANCE NOTICED PRIOR TO BEGINNING OF ACTUAL WORK AND ALL REQUIRED INSPECTION REQUESTS, AT (650)588–7230.
5. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES AND TOPOGRAPHIC FEATURES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE TRUE LOCATION OF ALL EXISTING UTILITIES RELATIVE TO THE TOPOGRAPHIC FEATURES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, BUILDINGS AND WALLS. THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES THAT WILL BE AFFECTED BY THE WORK TO OBTAIN ASSISTANCE IN LOCATING EXISTING MAINS AND SERVICE CONNECTIONS. A LIST OF MAJOR UTILITY COMPANIES WITH KNOWN EXISTING UNDERGROUND UTILITIES IN THE AREA IS:

| UTILITY COMPANY | UTILITY | TELEPHONE NO. |
|---|---|---|
| PG&E | GAS | 650–598–7437 |
| PG&E | ELECTRIC | 650–598–7379 |
| AT&T | TELEPHONE | 408–493–7237 |
| CITY OF BURLINGAME | WATER, SANITARY | 650–558–7670 |
| | SEWER, & STORM | 650–558–7679 |

PRIOR TO ANY DIGGING CALL U.S.A. (800) 642–2444 OR 811 48 HOURS IN ADVANCE TO HAVE EXISTING UNDERGROUND FACILITIES MARKED.

6. THE CONTRACTOR SHALL COORDINATE THE CONSTRUCTION OPERATION WITH ALL THE UTILITIES COMPANIES WHICH ARE TO RELOCATE OR INSTALL THEIR UTILITIES TO ACHIEVE AN EFFICIENT SCHEDULE OF OPERATIONS THAT DOES NOT DELAY CONSTRUCTION.
7. AS PART OF THEIR PRE–BID INSPECTION, BIDDERS SHALL VISIT THE SITE AND NOTE THE TYPE AND LOCATION OF OVERHEAD UTILITIES IN THE PROPOSED WORK AREA. BIDDERS PRICE SHALL INCLUDE PROVISIONS FOR WORKING IN AREAS WHERE OVERHEAD UTILITIES EXIST AT THE TIME OF BIDDING, WHETHER SHOWN ON THE PLAN OR NOT, AND NO ADDITIONAL COMPENSATION IS ALLOWED.
8. THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER OF ANY DISCREPANCIES OR UNUSUAL CONDITIONS ASSOCIATED WITH THE PLANS, DETAILS OR CONSTRUCTION NOTES FIVE (5) DAYS PRIOR TO FINALIZATION OF BIDS AND COMMENCEMENT OF ANY CONSTRUCTION.
9. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROTECT ANY SURVEYING MONUMENTS FOUND WITHIN PROJECT AREA, AND FURTHER THE CONTRACTOR SHALL SHALL BE FINANCIALLY RESPONSIBLE FOR RESETTING MONUMENTS DAMAGED OR DESTROYED BY THE CONSTRUCTION OPERATIONS.
10. HORIZONTAL AND VERTICAL DIMENSIONS PROVIDED ON THE DRAWINGS ARE BASED ON FIELD MEASUREMENTS. ADJUSTMENTS MAY BE MADE BY THE ENGINEER DURING CONSTRUCTION. PAYMENT WILL BE BASED ON QUANTITIES INSTALLED.
11. REFER TO SPECIFICATIONS FOR TRAFFIC CONTROL RESTRICTIONS AND HOURS OF WORK.
12. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS AND FOOT TRAFFIC AT ALL TIMES EXCEPT WHEN PRECLUDED BY NECESSARY CONSTRUCTION, AS NOTED IN CALTRANS TRAFFIC MANUAL AND AS APPROVED BY THE CITY ENGINEER OR RESIDENT TO CLOSE ACCESS.
13. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGMAN OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
14. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY FIELD CHANGES MADE WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE CITY ENGINEER.
15. UPON SATISFACTORY COMPLETION OF THE WORK, THE ENTIRE WORK SITE SHALL BE CLEANED AND LEFT FREE OF CONSTRUCTION WASTE, RUBBISH AND DEBRIS OF ANY NATURE TO THE SATISFACTION OF THE CITY ENGINEER.
16. CONSTRUCTION STAKING TO BE PROVIDED BY THE CONTRACTOR. CONSTRUCTOR SHALL MAINTAIN STAKING POINTS AT ALL TIMES DURING CONSTRUCTION.
17. NOTES APPEARING ON THESE PANS SHALL BE CONSIDERED AS REFERRING TO INCIDENTAL WORK REQUIRED FOR THE ACTIVITIES SPECIFICALLY LISTED IN THE BID SCHEDULE. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED FOR ACTIVITIES OTHER THAN THOSE LISTED IN THE BID SCHEDULE.
18. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT AND APPARATUS NOT SPECIFICALLY MENTIONED ON THE PLANS OR SPECIFICATIONS, BUT WHICH ARE NECESSARY TO COMPLETE THE CONTRACTED WORK.
19. THE CONTRACTOR SHALL SUPPLY AND MAINTAIN SANITARY FACILITIES FOR THE WORKERS AT THE CONSTRUCTION SITE.
20. THE CONTRACTOR SHALL SATISFY THEMSELVES AS TO THE CORRECTNESS OF THE EXISTING TOPOGRAPHY, UTILITIES, AND EXISTING CONDITIONS PRIOR TO BIDDING THE PROJECT.
21. TREES AND SHRUBS WITHIN THE CITY RIGHT–OF–WAY AND ON PRIVATE PROPERTY ADJACENT TO THE PROJECT WORK, NOTED ON THE PLANS TO BE PROTECTED, SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION. CONTRACTOR SHALL DEVELOP METHODS TO WORK AROUND THE TREES.
22. CONTRACTOR TO CONTACT CITY ENGINEER, INSPECTOR, AND CITY ARBORIST TO IDENTIFY TREES TO BE PRUNED OR REMOVED FROM CITY EASEMENT AS REQUIRED FOR ACCESS TO PROJECT AREA.
23. CONTRACTOR IS RESPONSIBLE FOR SELECTING THE MEANS, METHODS, AND EQUIPMENT TO CONSTRUCT THE IMPROVEMENTS IDENTIFIED ON THE DRAWINGS.
24. THE PAVEMENT GRINDING MAY CONTAIN FABRIC, ENGINEERED PAVING MAT, OR OTHER CONTAMINATED MATERIALS IN SOME CITY STREETS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REMOVE AND DISPOSE OF THESE MATERIALS ALONG WITH THE GRINDING. THERE WILL BE NO ADDITIONAL COMPENSATION ALLOWED.

## PUBLIC WORKS NOTES

1. ANY WORK IN THE CITY RIGHT–OF–WAY, SUCH AS STREET, SIDEWALK AREA, PUBLIC EASEMENTS, AND UTILITY EASEMENTS, IS REQUIRED TO OBTAIN AN ENCROACHMENT PERMIT PRIOR TO STARTING WORK.
2. ALL WORK WITHIN CITY RIGHT–OF–WAY SHALL COMPLY WITH CITY STANDARDS AND DETAILS. STANDARD DETAILS ARE AVAILABLE AT HTTP://WWW.DOT.CA.GOV/HQ/ESC/OE/CONSTRUCTION_STANDARDS.HTML
3. ALL DAMAGED AND DISPLACED CURB, GUTTER AND/OR SIDEWALK FRONTING SITE MUST BE REPLACED PRIOR TO FINAL OF BUILDING PERMIT
4. CONSTRUCTION HOURS IN THE CITY PUBLIC RIGHT–OF–WAY ARE LIMITED TO WEEKDAYS AND NON–CITY HOLIDAYS BETWEEN 8:00 A.M. AND 5:00 P.M. THIS INCLUDES CONSTRUCTION HAULING.
5. PER MUNICIPAL CODE SECTION 18.08.090, NO STORM WATER OR UNDERGROUND WATER DRAINING FROM ANY LOT, BUILDING, OR PAVED AREA SHALL BE ALLOWED TO DRAIN TO ADJACENT PROPERTIES NOR SHALL THIS WATER BE CONNECTED TO THE CITY'S SANITARY SEWER SYSTEM. REGARDLESS OF THE SLOPE OF THE SOURCE PROPERTY, SUCH WATER SHALL DRAIN TO EITHER ARTIFICIAL OR NATURAL STORM DRAINAGE FACILITIES BY GRAVITY OR PUMPING.
6. NO STRUCTURE SHALL BE BUILT INTO CITY'S RIGHT–OF–WAY. THE PROPERTY LINE ON BURLINGAME IS APPROXIMATELY 17.1–FEET MEASURED FROM FACE OF CURB.
7. THE PROJECT SHALL COMPLY WITH THE CITY'S NPDES PERMIT REQUIREMENTS TO PREVENT STORM WATER POLLUTION.
8. ALL DEBRIS/GARBAGE CONTAINERS LOCATION SHALL BE ON PROPERTY. IN SITUATION WHERE THAT IS NOT POSSIBLE, AN ENCROACHMENT PERMIT IS REQUIRED FROM PUBLIC WORKS DEPARTMENT FOR PLACING DEBRIS/GARBAGE CONTAINERS IN PUBLIC RIGHT–OF–WAY. NO WET GARBAGE FLUID SHALL ENTER PUBLIC RIGHT–OF–WAY OR THE STORM DRAIN SYSTEM.
9. IT IS THE RESPONSIBILITY OF THE OWNER AND/OR CONTRACTOR TO NOTIFY UNDERGROUND SERVICE ALERT (USA) AT LEAST 48 HOURS BEFORE THE START OF ANY EXCAVATION WORK.

## CONSTRUCTION NOTES

THE FOLLOWING CONTROL MEASURES FOR CONSTRUCTION ACTIVITIES SHALL BE ADHERED TO, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.

1. NOT USED.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF ANY EXCESS MATERIALS FROM THE WORK SITE.
3. EROSION CONTROL MEASURES SHALL BE INSTALLED AS NECESSARY TO PREVENT SEDIMENT RUNOFF TO PUBLIC ROADWAY DRAINAGE FACILITIES, ADJACENT PROPERTIES AND THE SAN FRANCISCO BAY.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES ON OR OFF THE PROJECT SITE AS A RESULT OF LACK OF DUST CONTROL.
5. DURING THE PROGRESS OF THE CONSTRUCTION WORK THE CONTRACTOR SHALL MAINTAIN THE PREMISES IN A NEAT AND CLEAN CONDITION, DISPOSING OF REFUSE IN A SATISFACTORY MANNER AS OFTEN AS DIRECTED OR AS MAY BE NECESSARY SO THAT THERE SHALL BE AT NO TIME ANY UNSIGHTLY ACCUMULATION OF RUBBISH AT THE JOB SITE.
6. CONTRACTOR TO ADHERE TO ALL REQUIREMENTS OF THE SAN MATEO COUNTY HEALTH SERVICES AGENCY.
7. STORAGE OF CONSTRUCTION MATERIALS AND EQUIPMENT WILL NOT BE ALLOWED IN OR UPON THE PUBLIC RIGHT–OF–WAY. ALL MATERIALS INTENDED FOR USE ON ANY PROJECT SHALL BE OFF LOADED DIRECTLY FROM DELIVERY VEHICLES AND PLACED AS REQUIRED DURING THE COURSE OF CONSTRUCTION. SHOULD THE PERMIT HOLDER OR SUBCONTRACTORS WISH TO STOCKPILE MATERIALS NEAR THE WORK SITE, THEY SHALL MAKE ARRANGEMENTS IN ADVANCE FOR STORAGE. ALL STORAGE SITES SHALL BE SECURE, INACCESSIBLE TO THE GENERAL PUBLIC AND KEPT FREE OF CONSTRUCTION SPOILS, DEBRIS AND TRASH AT ALL TIMES STORAGE SITES SHALL BE SUBJECT TO THE REVIEW AND APPROVAL OF THE CITY ENGINEER.
8. CONTRACTOR SHALL COMPLY WITH THE RULES AND REGULATIONS OF THE STATE CONSTRUCTION SAFETY ORDERED.
9. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAG MEN OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY & TRAFFIC CONTROL.
10. THE CONTRACTOR SHALL POST EMERGENCY TELEPHONE NUMBERS FOR POLICE, FIRE, AMBULANCE, AND THOSE AGENCIES RESPONSIBLE FOR MAINTENANCE OF UTILITIES IN THE VICINITY OF JOB SITE.
11. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY SOIL OR WATER CONTAMINATION NOTICED DURING CONSTRUCTION TO THE CITY OF BURLINGAME FIRE DEPARTMENT HAZARDOUS MATERIALS DIVISION, THE SAN MATEO COUNTY DEPARTMENT OF HEALTH, AND THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE SITE OR SURROUNDING AREA DUE TO DUST OR EROSION, RESULTING FROM WORK DONE BY THE CONTRACTOR. CONTRACTOR SHALL PROVIDE A SEVEN (7) DAY PHONE NUMBER TO RECEIVE AND RESPONSE TO DUST COMPLAINTS RESULTING FROM ALL CONSTRUCTION OPERATIONS AND SHALL BE MAINTAINED UNDER CONSTRUCTION IS COMPLETE. ALL BUSINESSES AND RESIDENTS WITHIN 300' OF THE PROJECT SHALL BE NOTIFIED BY THE CONTRACTOR BY MAIL WITH INFORMATION AND COMPLAINT LINES TO BE CALLED.
13. CONTRACTOR IS TO MAINTAIN ALL JOB SITE FACILITIES UNTIL ACCEPTED BY THE CITY.
14. ALL EXCAVATION SPOILS SHALL BE PLACED DIRECTLY INTO TRUCKS AND DISPOSED OF AT AN APPROVED DUMPSITE.
15. CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY DAMAGED OR DISRUPTED STRIPING IN–KIND.
16. PETROMAT MAY BE FOUND IN THE AC. CONTRACTOR IS RESPONSIBLE FOR REMOBAL AND PROPER DISPOSAL.
17. ALL CURB AND GUTTER REPLACED SHALL HAVE A 2 FOOT SAWCUT CONFORM, UNLESS OTHERWISE NOTED ON PLANS.
18. SURVEY ELEVATIONS SHOWN ARE BASED ON ASSUMED BENCHMARKS. ELEVATIONS DO NO RELATE TO SEA LEVEL.
19. CONTRACTOR SHALL ADJUST ALL EXISTING SURFACE UTILITY FEATURES FOR ASPHALT AND CONCRETE REPAVING. UPON COMPLETION, UTILITY FEATURES SHALL BE SET FLUSH WITH NEW SURFACE GRADE. ADJUSTMENT OF ALL EXISTING SURFACE UTILITY FEATURES SHALL BE INCLUDED IN CONTRACTORS PRICE WHETHER OR NOT SPECIFICALLY CALLED OUT ON THE PLANS.
20. CONTRACTOR SHALL ACCOUNT FOR NECESSARY GROUNDWATER CONTROL.

## CONCRETE GENERAL NOTES

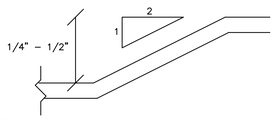
1. SUBGRADE SHALL BE COMPACTED TO AL LEAST 95% RELATIVE COMPACTION. WHERE SUBGRADE CANNOT BE COMPACTED TO 95% REMEDIAL METHODS SHOWN SHALL BE INCORPORATED IN THE WORK.
2. WHERE UNSUITABLE SUBGRADE MATERIAL IS ENCOUNTERED, REMEDIAL WORK TO BE DONE UNDER THE DIRECTION OF THE CITY ENGINEER, INCLUDES BUT IS NOT LIMITED TO, REMOVING UNSUITABLE MATERIAL AND PLACING A LAYER OF GEOTECHNIC FABRIC AND CLASS 2 AGGREGATE BASE COMPACTED TO 95% UNDER THE INSTALLATION.
3. OVER–EXCAVATED SUBGRADE FOR GUTTER OR SIDEWALK SHALL BE BACK–FILLED WITH CLASS 2 AGGREGATE BASE MATERIAL.
4. EXISTING CONCRETE SHALL BE REMOVED AT EXPANSION OR WEAKENED PLANE JOINTS BY SAWCUTTING.
5. SAW CUTS MUST BE FILL DEPTH.
6. NEW WORK SHALL MATCH EXISTING IN SCORE AND COLOR.
7. SUBGRADE SHALL BE THOROUGHLY WETTED IMMEDIATELY PRIOR TO PLACING CONCRETE.
8. SEE PROJECT SPECIFICATIONS FOR CONCRETE TYPE AND FINISHES.
9. CONCRETE SHALL HAVE A SLUMP OF NOT MORE THAN 4 INCHES.
10. NO ADMIXTURES SHALL BE USED WITHOUT THE PERMISSION OF THE CITY ENGINEER.
11. 1/2–INCH THICK EXPANSION JOINTS SHALL BE PLACED ON BOTH SIDES OF DRIVEWAY APPROACHES, CURB, CUTTER AND SIDEWALK RETURN POINTS AND AT 20' FEET ON CENTER.
12. WEAKENED PLANE JOINTS AT LEAST 1–1/2 INCHES DEEP SHALL BE PLACED AT THE CENTER OF DRIVEWAYS AND 20' ON CENTER.
13. 1/4–INCH DEEP SCORE MARKS SHALL BE PLACED AS DESCRIBED IN THE STANDARD SPECIFICATIONS OR AS DIRECTED BY THE DIRECTED BY THE CITY ENGINEER.
14. NO CONCRETE SHALL BE PLACED UNTIL THE CITY ENGINEER OR HIS AUTHORIZED REPRESENTATIVE HAS INSPECTED AND APPROVED FORMS AND SUBGRADE.
15. ALL EXPOSED EDGES SHALL BE ROUNDED WITH 1/2–INCH RADIUS TOOL.
16. ALL SURFACES SHALL BE BROOM FINISHED FOR CURB AND GUTTER. REFER TO PROJECT SPECIFICATIONS FOR FLATWORK AND OTHER CONCRETE IMPROVEMENTS FINISHES.
17. CURBS, SIDEWALKS AND DRIVEWAY APPROACHES SHALL BE BACK FILLED WITHIN 7 DAYS AFTER PLACING CONCRETE. THIS SHALL INCLUDE ANY REQUIRED AC PATCHWORK.
18. FORM FACES SHALL NOT VARY FROM THE DIMENSIONS SHOWN BY MORE THAN .02 FEET. FORMS SHALL MEET GRADE.
19. UNLESS OTHERWISE SPECIFIED ON THE APPROVED PLANS, CONCRETE SHALL BE CURED BY MEANS OF THE IMPERVIOUS MEMBRANE METHOD.
20. ALL WORK WITHIN THE PUBLIC RIGHT–OF–WAY SHALL BE PERFORMED BY A STATE LICENSED "CLASS A" CONTRACTOR. A CONCRETE CONTRACTOR WITH A "C" LICENSE MAY PERFORM CONCRETE FLAT WORK.
21. A MINIMUM OF 12" OF ASPHALT SHALL BE REMOVED ALONG THE GUTTER LIP FOR THE INSTALLATION FOR FORMS. FOR CURB AND GUTTER INSTALLATIONS AC SHALL BE BROUGHT TO FINISH GRADE OF FORMS AND TRANSITIONS AS REQUIREMENT BY THE CITY ENGINEER.
22. ALL ASPHALT REPAIRS SHALL BE FLUSH WITH THE ADJACENT SURFACES AT CONFORMS AND EDGES. MAXIMUM ALLOWABLE TOLERANCES SHALL BE .01' LONGITUDINALLY AND .02' TRANSVERSELY.
23. ALL DRIVEWAYS, CURB AND GUTTER, AND SIDEWALK REPLACEMENTS SHALL BE PER CITY STANDARDS. CONTRACTOR IS RESPONSIBLE FOR UNDERSTANDING THESE DETAILS FOR PROPER BIDDING AND INSTALLATION.

## UNDERGROUND NOTES

1. LOCATIONS OF EXISTING UNDERGROUND FACILITIES AND UTILITIES SHOWN ARE BASED ON AVAILABLE UTILITY COMPANY INFORMATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE ACTUAL LOCATION OF UTILITIES PRIOR TO THE COMMENCEMENT OF WORK. THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT (U.S.A.) AT (800)227–2600 AT LEAST 48 HOURS IN ADVANCE OF ANY EXCAVATING.
2. PHYSICAL VERIFICATION OF UTILITY LOCATION SHALL BE PERFORMED BY POT HOLING OR HAND DIGGING AND CAREFUL SUBSURFACE PROBING IN CONFORMANCE WITH ARTICLE 6 OF THE CAL/OSHA CONSTRUCTION SAFETY ORDERS. ANY DEVIATIONS FROM LOCATIONS SHOWN ON PLANS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION BEFORE STARTING CONSTRUCTION.
3. EXISTING UTILITIES ARE SHOWN PER AVAILABLE INFORMATION. THERE MAY BE ADDITIONAL EXISTING LINE NOT SHOWN ON THE PLANS. CONTRACTOR SHALL BE CAREFUL TO AVOID ANY DAMAGE TO THESE UTILITY SERVICES.
4. ALL EXISTING UTILITIES AND IMPROVEMENTS THAT BECOME DAMAGED DURING CONSTRUCTION SHALL BE COMPLETELY RESTORED TO THE SATISFACTION OF THE CITY ENGINEER AND THE UTILITY OWNER AT THE CONTRACTOR'S SOLE EXPENSE.
5. MAIN UTILITIES, OTHER THAN WATER, SANITARY SEWER, AND STORM IN CONFLICT WITH THE WORK WILL BE RELOCATED BY OTHERS. WATER MAINS, SANITARY SEWER MAINS, STORM DRAINS AND THEIR SERVICES REQUIRED TO BE TEMPORARILY OR PERMANENTLY RELOCATED FOR CONSTRUCTION OF PROPOSED IMPROVEMENTS SHALL BE RELOCATED BY THE CONTRACTOR.

## PATH OF TRAVEL

1. WALKS AND SIDEWALKS TO HAVE A CONTINUOUS COMMON SURFACE NOT INTERRUPTED BY STEPS OR BY ABRUPT CHANGES IN LEVEL EXCEEDING 1/4 INCH AND BE A MINIMUM OF 4 FEET IN WIDTH.
2. SURFACE CROSS SLOPES TO NOT EXCEED 1:48.
3. WALKS, SIDEWALKS, AND PEDESTRIAN WAYS TO BE FREE OF GRATINGS WHENEVER POSSIBLE. FOR GRATINGS LOCATED IN THE SURFACE OF ANY OF THESE AREAS, GRID OPENINGS IN GRATINGS TO BE LIMITED TO 1/2 INCH IN THE DIRECTION OF TRAVEL. GRATINGS WITH ELONGATED OPENINGS TO BE PLACED PERPENDICULAR TO PATH OF TRAVEL.
4. WHEN THE SLOPE IN THE DIRECTION OF TRAVEL OF ANY WALK EXCEEDS 1 VERTICAL TO 20 HORIZONTAL, OR 5%, IT MUST COMPLY WITH THE PROVISIONS FOR PEDESTRIAN RAMPS.
5. ABRUPT CHANGES IN LEVEL ALONG ANY ACCESSIBLE ROUTE NOT TO EXCEED 1/4 INCH. WHEN CHANGES IN LEVEL DO OCCUR, THEY MUST BE BEVELED WITH A SLOPE NO GREATER THAN 1:2 EXCEPT THAT LEVEL CHANGES NOT EXCEEDING 1/4 INCH MAY BE VERTICAL WHEN CHANGES IN LEVEL GREATER THAN 1/2 INCH ARE NECESSARY COMPLY WITH THE REQUIREMENTS FOR CURB RAMPS.




## CONSTRUCTION HOURS–ONSITE

1. NO PERSON SHALL ERECT (INCLUDING EXCAVATION AND GRADING), DEMOLISH, ALTER OR REPAIR ANY BUILDING OR STRUCTURE OTHER THAN BETWEEN THE FOLLOWING HOURS EXCEPT IN THE CASE OF URGENT NECESSITY IN THE INTEREST OF PUBLIC HEALTH AND SAFETY, AND THEN ONLY WITH PRIOR WRITTEN APPROVAL FROM THE BUILDING OFFICIAL, WHICH APPROVAL SHALL BE GRANTED FOR A PERIOD NOT TO EXCEED THREE DAYS. **NO WORK ON SUNDAYS AND HOLIDAYS.** HOLIDAYS ARE THE FIRST DAY OF JANUARY, THE THIRD MONDAY OF FEBRUARY, THE LAST MONDAY OF MAY, THE FOURTH DAY OF JULY, THE FIRST MONDAY OF SEPTEMBER, THE ELEVENTH DAY OF NOVEMBER, THE FOURTH THURSDAY IN NOVEMBER AND THE TWENTY–FIFTH DAY OF DECEMBER. IF THE FIRST DAY OF JANUARY, THE FOURTH DAY OF JULY, THE ELEVENTH DAY OF NOVEMBER, OR THE TWENTY–FIFTH DAY OF DECEMBER FALLS UPON A SUNDAY THE FOLLOWING MONDAY IS A HOLIDAY.
CONSTRUCTIONS HOURS:

MONDAY THROUGH FRIDAY: 8AM TO 7PM
SATURDAYS; 9AM TO 6PM

## ENGINEER'S STATEMENT

REGISTERED PROFESSIONAL ENGINEER PATRICK CHAN C 83189 CIVIL STATE OF CALIFORNIA

THESE PLANS HAVE BEEN PREPARED BY ME OR UNDER MY DIRECTION IN ACCORDANCE WITH STANDARD ENGINEERING PRACTICE.

PATRICK CHAN, P.E. DATE
ASSOCIATE
BKF ENGINEERS

REGISTERED PROFESSIONAL ENGINEER PHONG KIET C 78237 CIVIL STATE OF CALIFORNIA

THESE PLANS HAVE BEEN PREPARED BY ME OR UNDER MY SUPERVISION IN ACCORDANCE WITH STANDARD ENGINEERING PRACTICE.

PHONG KIET, P.E. DATE
PROJECT MANAGER
BKF ENGINEERS

## ABBREVIATION:

| | |
|---|---|
| AC | ASPHALTIC CONCRETE |
| AD | AREA DRAIN |
| BFP | BACKFLOW PREVENTER |
| BLDG | BUILDING |
| BW | BACK OF WALK |
| CL DR | CENTERLINE DOOR |
| CLF | CHAIN LINK FENCE |
| COB | CITY OF BURLINGAME |
| CONC | CONCRETE |
| COR | CORNER |
| DI | DROP INLET |
| EG | EXISTING GRADE |
| EP | EDGE OF PAVEMENT |
| ETW | EDGE OF TRAVEL WAY |
| EX. | EXISTING |
| FC | FACE OF CURB |
| FF | FINISHED FLOOR |
| FD | FOUND |
| FDC | FIRE DEPARTMENT CONNECTION |
| FL | FLOW LINE |
| GB | GRADE BREAK |
| GND | GROUND |
| HP | HIGH POINT |
| INV | INVERT |
| IRR | IRRIGATION |
| IP | IRON PIPE |
| JP | JOINT POLE |
| LG | LIP OF GUTTER |
| LID | LOW IMPACT DEVELOPMENT |
| N.A.P. | NOT A PART |
| (N) | NEW |
| OU | ORIGIN UNKNOWN |
| PA | PERVIOUS AREA |
| PM | PARCEL MAP |
| PV | PAVEMENT |
| RC | RED CURB |
| ROW | RIGHT OF WAY |
| S.A.D. | SEE ARCHITECTURAL DRAWINGS |
| SD | STORM DRAIN |
| SDCO | STORM DRAIN CLEANOUT |
| SDMH | STORM DRAIN MANHOLE |
| SF | SQUARE FEET |
| S.L.D. | SEE LANDSCAPE DRAWINGS |
| SS | SANITARY SEWER |
| SSMH | SANITARY SEWER MANHOLE |
| SSCO | SANITARY SEWER CLEANOUT |
| S.T.D. | SEE STRUCTURAL DRAWINGS |
| SW | SIDEWALK |
| TC | TOP OF CURB |
| TRC | TOP OF ROLLED CURB |
| TYP. | TYPICAL |
| U.B. | UTILITY BOX |
| UPRR | UNION PACIFIC RAILROAD |
| VIF | VERIFY IN FIELD |
| W | WATER |
| WM | WATER METER |
| WV | WATER VALVE |

## SHEET INDEX:


| | |
|---|---|
| C1.0 | GENERAL NOTES |
| C2.0 | EXISTING CONDITIONS |
| C3.0 | DEMOLITION PLAN |
| C4.0 | GRADING AND DRAINAGE PLAN |
| C5.0 | UTILITY PLAN |
| C6.0 | STORM WATER CONTROL PLAN |
| C7.0 | STORM WATER CONTROL DETAILS |
| C8.0 | EROSION CONTROL PLAN |
| C9.0 | EROSION CONTROL DETAILS |
| C10.0 | CONSTRUCTION DETAILS |
| C11.0 | CROSS SECTIONS |
| C12.0 | BEST MANAGEMENT PRACTICES |



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THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

# WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

REGISTERED PROFESSIONAL ENGINEER CIVIL STATE OF CALIFORNIA

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| SCHEMATIC DESIGN | 11/02/18 |
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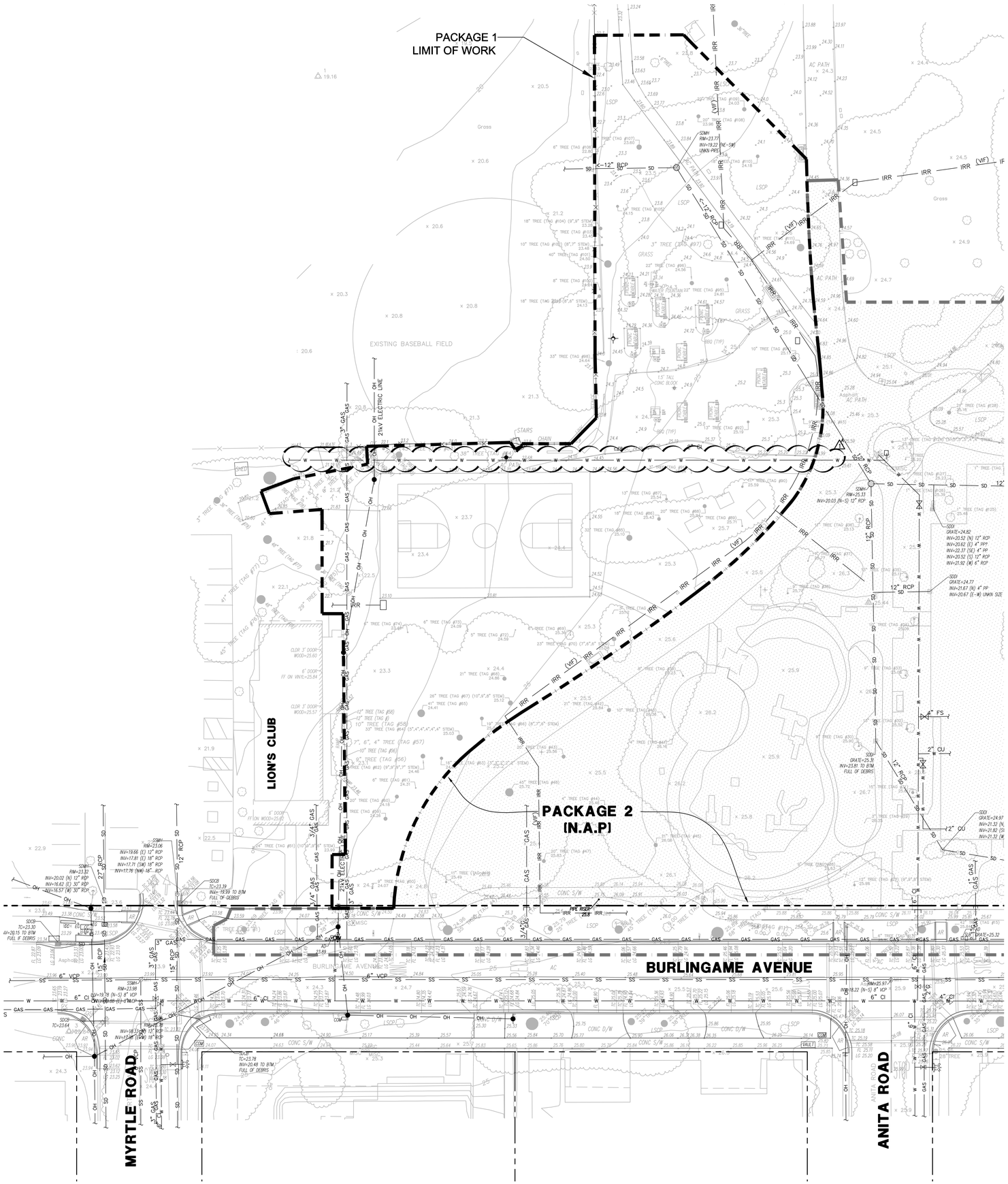
SHEET TITLE AND NO.

GENERAL NOTES

C1.0

**PACKAGE 1**




# LEGEND:

| | |
|---|---|
| SD | (E) STORMDRAIN PIPE |
| SS | (E) SANITARY SEWER PIPE |
| W | (E) WATER PIPE |
| IRR | (E) IRRIGATION WATER PIPE, VERIFIED IN FIELD (VIF) |
| GAS | (E) GAS PIPE |
| E | (E) ELECTRICAL UNDERGROUND LINE |
| OH | (E) ELECTRICAL OVERHEAD LINE |
| | (E) FIRE HYDRANT |
| | (E) ELECTROLIER (BASEBALL FIELD) |
| | (E) JOINT POLE |

GRAPHIC SCALE

( IN FEET )
1 inch = 20 ft.

PACKAGE 1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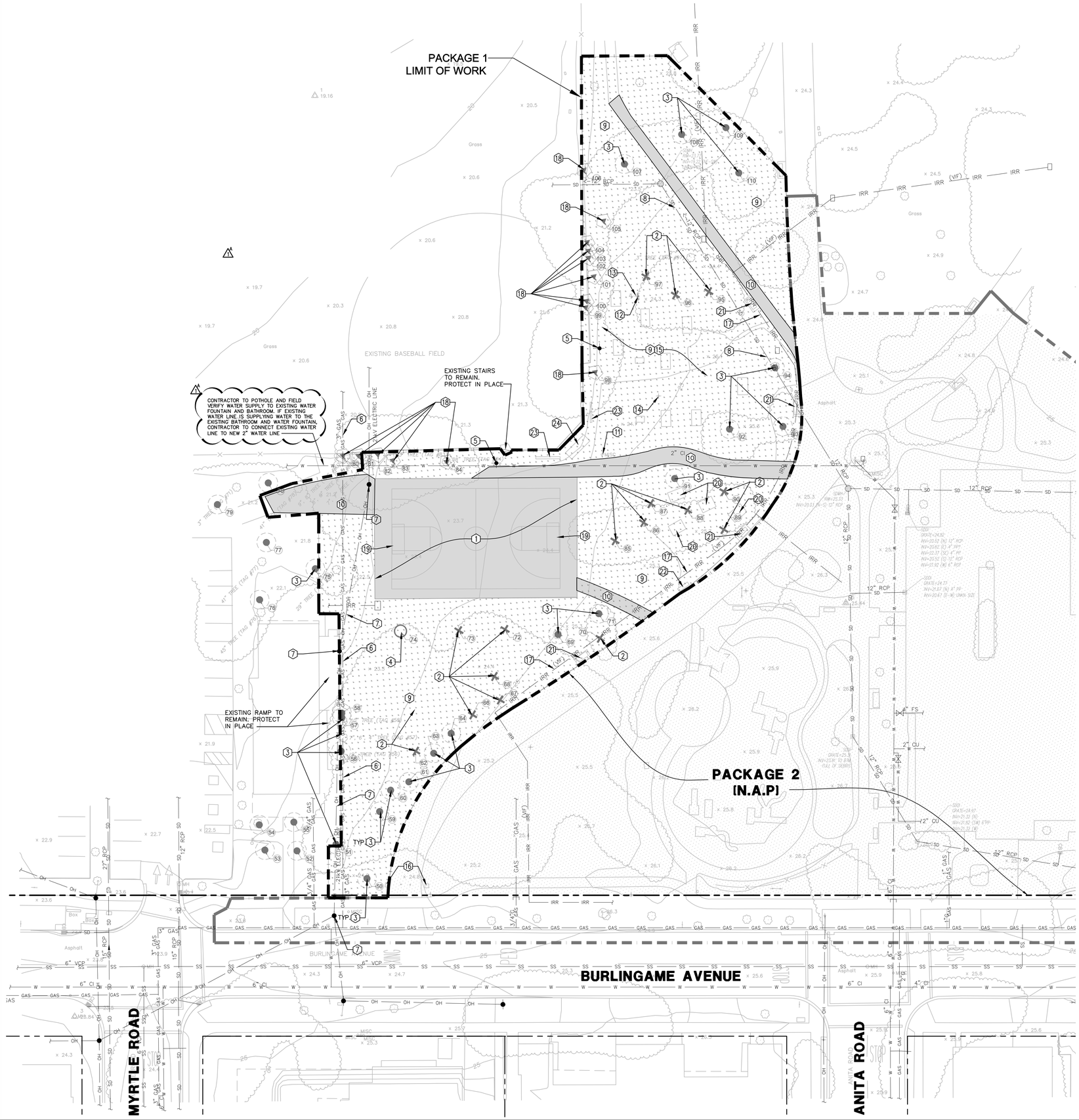
SHEET TITLE AND NO.

EXISTING CONDITIONS

C2.0




## KEYED NOTES

1. REMOVE APHALT BASKETBALL COURT AND ASSOCIATED BASE ROCK.
2. REMOVE EXISTING TREE. SEE LANDSCAPE PLANS FOR ADDITIONAL INFORMATION.
3. PROTECT EXISTING TREE. SEE LANDSCAPE PLANS FOR ADDITIONAL INFORMATION.
4. EXISTING TREE TO BE RELOCATED BY CITY. SEE LANDSCAPE PLANS FOR ADDITIONAL INFORMATION.
5. PROTECT EXISTING ELECTROLIERS.
6. PROTECT EXISTING GAS LINE.
7. PROTECT EXISTING ELECTRIC OVERHEAD LINES AND JOINT POLES.
8. PROTECT EXISTING STORM DRAIN LINE.
9. CLEAR AND GRUB EXISTING VEGETATION AND PLANTING AREA.
10. REMOVE ASPHALT PATH AND ASSOCIATED BASE ROCK.
11. ELECTRICAL BOX TO REMAIN. PROTECT IN PLACE ADJUST TO NEW GRADE
12. REMOVE WATER FOUNTAIN
13. REMOVE AREA DRAIN
14. REMOVE PARK LIGHT. EXISTING LIGHT POLE TOP TO BE SALVAGED
15. REMOVE PICNIC TABLES.
16. EXISTING HISTORICAL PILLAR TO REMAIN. PROTECT IN PLACE
17. PROTECT EXISTING IRRIGATION LINE.
18. EXISTING TREE TO BE REMOVED BY CITY. SEE LANDSCAPE PLANS FOR ADDITIONAL INFORMATION.
19. EXISTING BASKETBALL BACKBOARDS TO BE SALVAGED (2)
20. EXISTING PICNIC TABLES TO BE SALVAGED (4)
21. EXISTING BENCH TO BE SALVAGED (4)
22. REMOVE EXISTING BENCH
23. EXISTING BLEACHERS BENCH TOP TO BE SALVAGED (2)
24. EXISTING BLEACHERS TO BE SALVAGED (1)

## DEMOLITION LEGEND

- EXISTING PROPERTY LINE
- EXISTING LOT LINE
- LIMIT OF WORK
- VEGETATION AND PLANTING AREA
- ASPHALT PAVING
- BUILDING STRUCTURE
- PLAYGROUND
- TREES TO BE PROTECTED
- TREES TO BE REMOVED
- TREES TO BE RELOCATED BY CITY PRIOR TO PACKAGE 1 PROJECT
- TREES TO BE REMOVED BY CITY PRIOR TO PACKAGE 1 PROJECT
- REMOVE EXISTING UTILITY

## CITY NOTE

CITY OF BURLINGAME PARKS DIVISION TO PICK UP ITEMS TO BE SALVAGED AT THE TIME WHEN THE CONSTRUCTION FENCE WILL BE INSTALLED AND PRIOR TO THE SITE DEMOLITION.

CONTRACTOR TO NOTIFY CITY 72 HOURS PRIOR TO WHEN CONSTRUCTION FENCE WILL BE INSTALLED AND COORDINATE/PROVIDE ACCESS TO THE SITE FOR REMOVAL OF ITEMS TO BE SALVAGED.

ITEMS TO BE REMOVED AND SALVAGE INCLUDE:

1. TRASH AND RECYCLING RECEPTACLES (8)
2. TOP FIXTURE ON THE LIGHT POLE (1)
3. BASKETBALL BACKBOARDS (2)
4. PICNIC AREA SIGN BOARD (1)
5. NEWER STYLE DUMOR BENCHES (4)
6. NEWER STYLE PICNIC TABLES (4)

GRAPHIC SCALE

( IN FEET )
1 inch = 20 ft.

PACKAGE 1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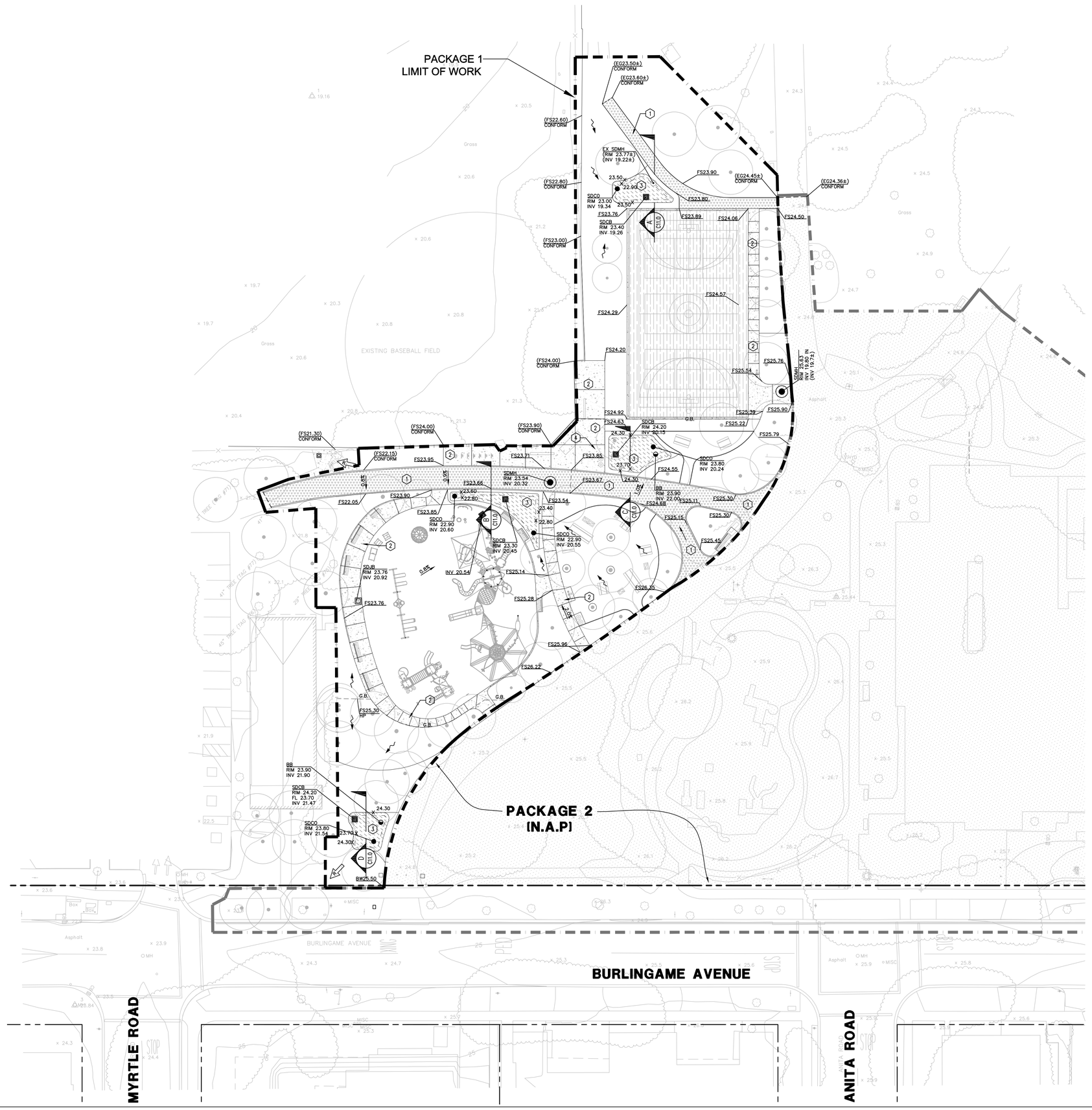
SHEET TITLE AND NO.

DEMOLITION PLAN

C3.0




## KEYED NOTES

1. INSTALL ASPHALT PEDESTRIAN PATH (2.5"AC/8"AB CL. II). S.L.D. FOR FINISH SURFACE
2. INSTALL CONCRETE PEDESTRIAN PATH (4"PCC/4"AB CL. II). S.L.D. FOR FINISHED SURFACE AND JOINTS
3. INSTALL BIORETENTION AREA PER DETAIL 1, SEE SHEET C10.0
4. ADJUST EXISTING ELECTRICAL BOX TO NEW GRADE

## GRADING LEGEND

- EXISTING PROPERTY LINE
- EXISTING LOT LINE
- LIMIT OF WORK
- G.B. — GRADE BREAK
- BIORETENTION AREA
- ASPHALT PAVING (PEDESTRIAN) (S.L.D.)
- PEDESTRIAN CONCRETE (4" AC/4"AB)
- MULTI-USE COURT ASPHALT + ACRYLIC COLOR COATING (2.5"AC/8" AB CL.II) (S.L.D.)
- (EG 23.9±) CONFORM — EXISTING ELEVATION
- TC 25.24 FL 24.74 — PROPOSED ELEVATION
- GC 25.24 FL 24.74 — PROPOSED TOP OF CURB ELEVATION AT CURB CUT
- RUNOFF DIRECTION
- STORMDRAIN CATCH BASIN
- STORMDRAIN JUNCTION BOX
- STORMDRAIN BUBBLER
- STORMDRAIN AREA DRAIN
- STORMDRAIN MANHOLE
- STORMDRAIN CLEANOUT
- STORMDRAIN OVERLAND RELEASE

GRAPHIC SCALE

20 0 10 20 40 80

( IN FEET )
1 inch = 20 ft.

PACKAGE 1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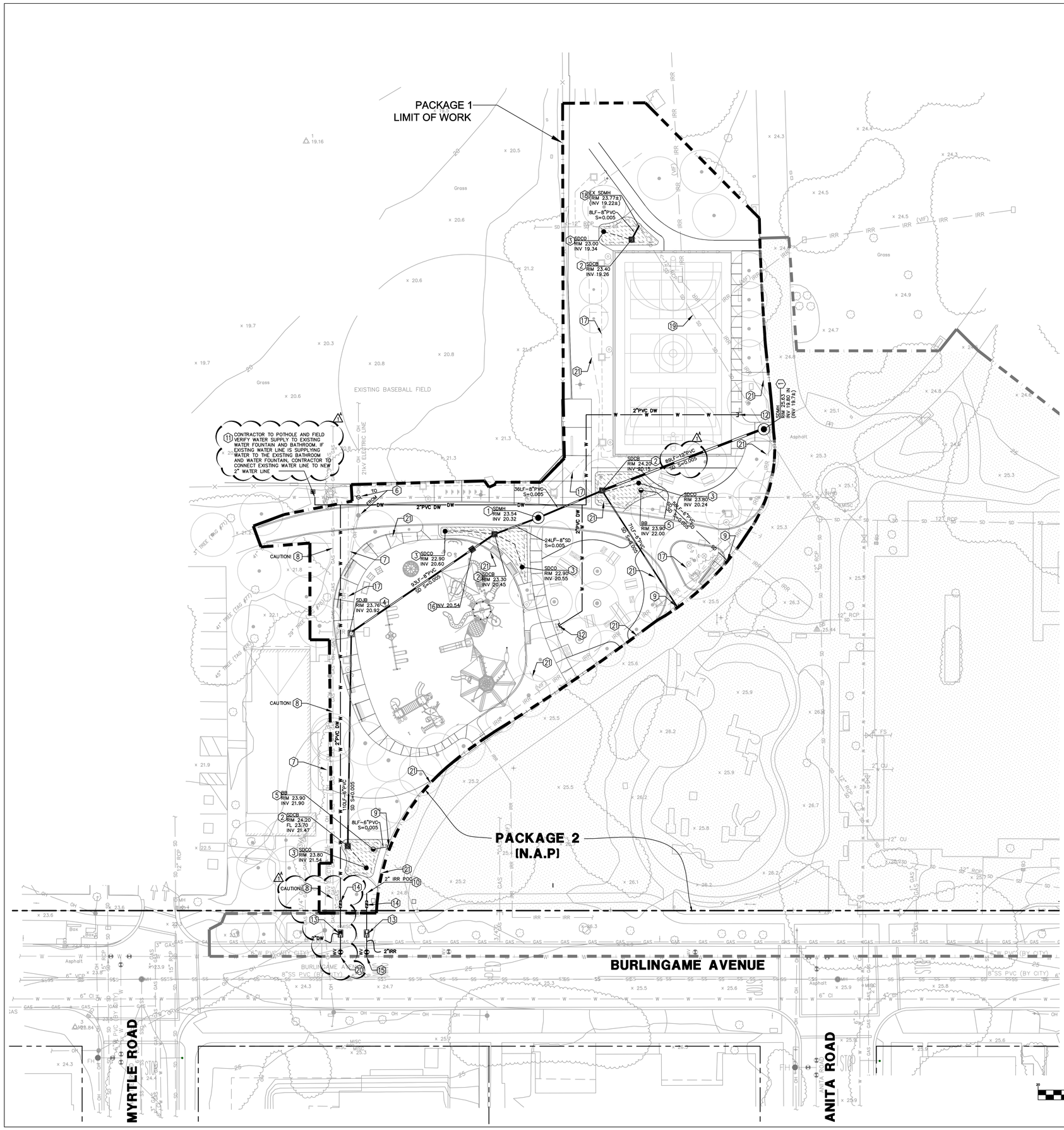
SHEET TITLE AND NO.

GRADING AND DRAINAGE PLAN

C4.0




## KEYNOTES

1. INSTALL STORM DRAIN MANHOLE
2. INSTALL STORM OVERFLOW DRAIN RISER PER DETAIL 5, SHEET C10.0
3. INSTALL STORM DRAIN CLEANOUT PER DETAIL 2, SHEET C10.0
4. INSTALL STORM DRAIN JUNCTION BOX PER DETAIL 3, SHEET C10.0. STORM DRAIN JUNCTION BOX TO HAVE NON SKID LID
5. INSTALL BUBBLER BOX PER DETAIL 4, SHEET C10.0
6. RELOCATE JOINT POLE (BY OTHERS)
7. EXISTING OVERHEAD ELECTRICAL LINE TO REMAIN
8. EXISTING GAS LINE TO REMAIN. PROTECT IN PLACE
9. PROVIDE STUB-OUT FOR FUTURE CONNECTION
10. SEE IRRIGATION PLANS FOR CONTINUATION
11. CONTRACTOR TO CONNECT NEW WATER LINE TO THE EXISTING WATER LINE SUPPLYING WATER TO THE EXISTING DRINKING FOUNTAIN AND/OR BATHROOM △1
12. WATER CONNECTION TO DRINKING FOUNTAIN (S.L.D.)
13. INSTALL 2" WATER METER
14. INSTALL 2" BACKFLOW PREVENTER
15. INSTALL 2" WATER SERVICE (IRRIGATION). INSTALLATION OF 2" WATER SERVICE FOR IRRIGATION AND METER BOX BY CITY △1
16. SUBGRADE DRAIN INLET, S.L.D. FOR DETAILS
17. ELECTRICAL LINES SHOWN FOR REFERENCE ONLY. SEE ELECTRICAL DRAWNGS FOR MORE INFORMATION
18. CCTV EXISTING STORM DRAIN MANHOLE. EXISTING MANHOLE TO BE REMOVED AND REPLACED AT THE DISCRETION OF THE CITY OF BURLINGAME AFTER CCTV HAS BEEN PROVIDED △1
19. CCTV EXISTING STORM DRAIN LINE. EXISTING STORM DRAIN LINE TO BE REMOVED AND REPLACED AT THE DISCRETION OF THE CITY OF BURLINGAME AFTER CCTV HAS BEEN PROVIDED
20. INSTALL 2" WATER SERVICE (DOMESTIC)
21. PROPOSED IRRIGATION LINE SHOWN FOR REFERENCE ONLY.

## UTILITY LEGEND

- PROPERTY LINE
- LOT LINE
- LIMIT OF WORK
- SANITARY LINE
- STORM DRAIN LINE
- WATER LINE
- FIRE WATER LINE
- JOINT TRENCH (BY OTHERS)
- GAS SERVICE (BY OTHERS)
- PERFORATED PIPE WITHIN BIORETENTION BASIN
- DIRT SWALE FLOW LINE
- OFD/CB — OVER FLOW DRAIN/CATCH BASIN
- SDJB — STORM DRAIN JUNCTION BOX
- BB — STORM DRAIN BUBBLER BOX
- CI — STORM DRAIN CURB INLET
- SDAD — STORM DRAIN AREA DRAIN
- SDMH — STORM DRAIN MANHOLE
- SDCO — STORM DRAIN CLEANOUT
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEANOUT
- SANITARY SEWER AREA DRAIN
- WV — WATER VALVE
- BO — BLOW OFF VALVE
- M — WATER METER
- BFP — BACKFLOW PREVENTOR
- BIORETENTION BASIN
- SURFACE FLOW DIRECTION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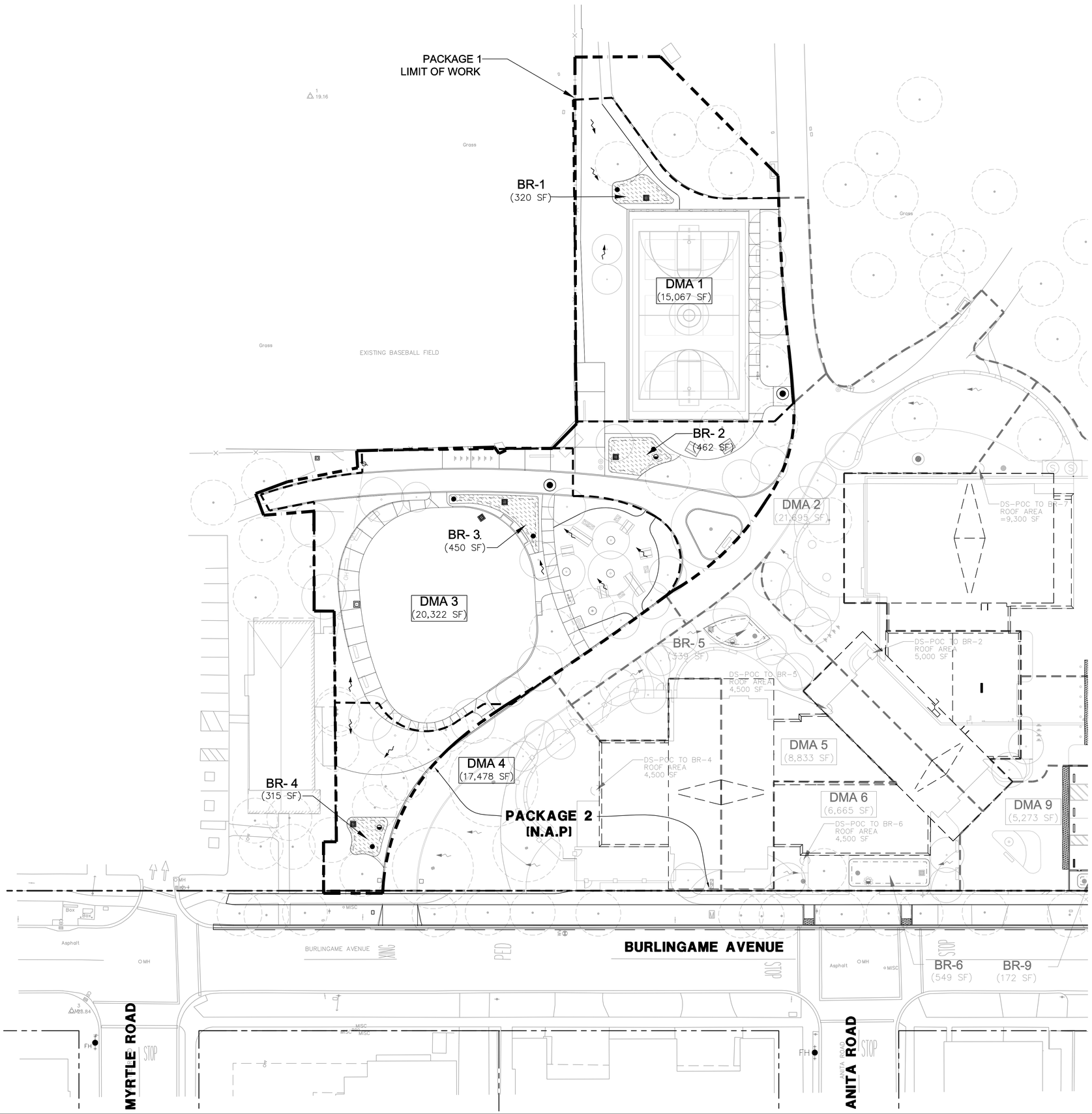
| △1 ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.

UTILITY PLAN

C5.0




## STORMWATER CONTROL LEGEND

- EXISTING PROPERTY LINE
- EXISTING LOT LINE
- LIMIT OF WORK
- DRAINAGE MANAGEMENT AREA
- BIORETENTION BASIN
- RUNOFF DIRECTION
- STORMDRAIN OVERFLOW DRAIN
- STORMDRAIN JUNCTION BOX
- STORMDRAIN BUBBLER
- STORMDRAIN AREA DRAIN
- STORMDRAIN MANHOLE
- STORMDRAIN CLEANOUT

## STORMWATER CONTROL NOTE

STENCIL STORM DRAIN INLETS WITH " NO DUMPING-FLOWS TO BAY" OR EQUIVALENT. CONTACT CITY OF BURLINGAME AT (650) 696-7230 TO OBTAIN INFORMATION ON CITY STENCIL

GRAPHIC SCALE

( IN FEET )
1 inch = 20 ft.

PACKAGE 1


G R O U P 4
ARCHITECTURE
RESEARCH +
PLANNING, INC
211 LINDEN AVENUE
SO. SAN FRANCISCO
C A 94080 USA
650 871 0709

BKF
ENGINEERS / SURVEYORS / PLANNERS
1730 N. FIRST ST.
SUITE 600
SAN JOSE, CA 95112
408-467-9100
408-467-9199 (FAX)


THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

# WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

REGISTERED PROFESSIONAL ENGINEER CIVIL STATE OF CALIFORNIA

| | |
|---|---|
| Project Arch. | ---- |
| CA REG. | ---- |
| PROJECT: | 12421-04 |

| ISSUE | DATE |
|---|---|
| SCHEMATIC DESIGN | 11/02/18 |
| BID SET | 3/25/19 |
| ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.

STORM WATER CONTROL PLAN

C6.0

## Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

### 1.0 Project Information

| | | |
|---|---|---|
| 1-1 | Project Name: | BURLINGAME COMM CENTER |
| 1-2 | City application ID: | |
| 1-3 | Site Address or APN: | 980-990 BURLINGAME |
| 1-4 | Tract or Parcel Map No: | |
| 1-5 | Rainfall Region | 6 |
| 1-6 | Region Mean Annual Precipitation (MAP) | 20.10 |
| 1-7 | Site Mean Annual Precipitation (MAP) | 22 |
| 1-8 | ***MAP adjustment factor is automatically calculated as:*** | 1.09 |

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 5.0 (2016). The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named 'Guidance from Chapter 5'.

Click here for map

*[The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, shown in Table 5-3, below.]*
*Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.*

### 2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **DMA1**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

| | Type of Surface | Area of surface type within DMA (Sq. Ft.) | Adjust Pervious Surface | Effective Impervious Area |
|---|---|---|---|---|
| 2-2 | Impervious surface | 9,947 | 1.0 | 9,947 |
| 2-3 | Pervious surface | 5,120 | 0.1 | 512 |
| | ***Total DMA Area (square feet) =*** | 15,067 | | |
| 2-4 | ***Total Effective Impervious Area (EIA)*** | 10,459 | **Square feet** | |

### 3.0 Calculate Unit Basin Storage Volume in Inches

**Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient**

| Region | Station, and Mean Annual Precipitation (Inches) | Runoff Coefficient of 1.0 |
|---|---|---|
| 1 | Boulder Creek, 55.9" | 2.04" |
| 2 | La Honda, 24.4" | 0.86" |
| 3 | Half Moon Bay, 25.92" | 0.82" |
| 4 | Pala Alto, 14.4" | 0.44" |
| 5 | San Francisco, 21.0" | 0.73" |
| 6 | San Francisco airport, 20.1" | 0.87" |
| 7 | San Francisco Oceanside, 19.3" | 0.72" |

| | | | |
|---|---|---|---|
| 3-1 | ***Unit basin storage volume from Table 5-3*** *[The coefficient for this method is always 1.0, due to the conversion of any landcaping to effective impervious area.]* | 0.85 | |
| 3-2 | ***Adjusted unit basin storage volume:*** *[The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].]* | 0.93 | Inches |
| 3-3 | ***Required Capture Volume (in cubic feet):*** *[The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet.]* | 811 | Cubic feet |

### 4.0 Calculate the Duration of the Rain Event

| | | | |
|---|---|---|---|
| 4-1 | Rainfall Intensity | 0.2 | Inches per hour |
| 4-2 | Divide Item 3-2 by Item 4-1 | 4.65 | Hours of Rain Event Duration |

### 5.0 Preliminary Estimate of Surface Area of Treatment Measure

| | | | |
|---|---|---|---|
| 5-1 | 4% of DMA EIA (Item 2-4) | 418.36 | Square feet |
| 5-2 | Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA) | 313.77 | Square feet |
| 5-3 | Volume of treated runoff for area in Item 5-2 | 608.16 | Cubic feet (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2) |

### 6.0 Initial Adjustment of Depth of Surface Ponding Area

| | | | |
|---|---|---|---|
| 6-1 | Subtract Item 5-3 from Item 3-3 | 202.72 | Cubic feet (Amount of runoff to be stored in ponding area) |
| 6-2 | Divide Item 6-1 by Item 5-2 | 0.65 | Feet (Depth of stored runoff in surface ponding area) |
| 6-3 | Convert Item 6-2 from feet to inches | 7.75 | Inches (Depth of stored runoff in surface ponding area) |
| 6-4 | If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1. *(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)* | | |

### 7.0 Optimize Size of Treatment Measure

| | | | |
|---|---|---|---|
| 7-1 | Enter an area larger than Item 5-2 | 320 | Sq.ft. (enter larger area if you need less ponding depth.) |
| 7-2 | Volume of treated runoff for area in Item 7-1 | 620.23 | Cubic feet (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2) |
| 7-3 | Subtract Item 7-2 from Item 3-3 | 190.64 | Cubic feet (Amount of runoff to be stored in ponding area) |
| 7-4 | Divide Item 7-3 by Item 7-1 | 0.60 | Feet (Depth of stored runoff in surface ponding area) |
| 7-5 | Convert Item 7-4 from ft. to inches | 7.15 | Inches (Depth of stored runoff in surface ponding area) |
| 7-6 | If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth. *(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)* | | |

### 8.0 Surface Area of Treatment Measure for DMA

| | | | |
|---|---|---|---|
| 8-1 | Final surface area of treatment | 320 | **Square feet** (Either Item 5-2 or final amount in Item 7-1) |



## Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

### 1.0 Project Information

| | | |
|---|---|---|
| 1-1 | Project Name: | BURLINGAME COMM CENTER |
| 1-2 | City application ID: | |
| 1-3 | Site Address or APN: | 980-990 BURLINGAME |
| 1-4 | Tract or Parcel Map No: | |
| 1-5 | Rainfall Region | 6 |
| 1-6 | Region Mean Annual Precipitation (MAP) | 20.10 |
| 1-7 | Site Mean Annual Precipitation (MAP) | 22 |
| 1-8 | ***MAP adjustment factor is automatically calculated as:*** | 1.09 |

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 5.0 (2016). The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named 'Guidance from Chapter 5'.

Click here for map

*[The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, shown in Table 5-3, below.]*
*Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.*

### 2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **DMA2**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

| | Type of Surface | Area of surface type within DMA (Sq. Ft.) | Adjust Pervious Surface | Effective Impervious Area |
|---|---|---|---|---|
| 2-2 | Impervious surface | 13,747 | 1.0 | 13,747 |
| 2-3 | Pervious surface | 7,948 | 0.1 | 795 |
| | ***Total DMA Area (square feet) =*** | 21,695 | | |
| 2-4 | ***Total Effective Impervious Area (EIA)*** | 14,542 | **Square feet** | |

### 3.0 Calculate Unit Basin Storage Volume in Inches

**Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient**

| Region | Station, and Mean Annual Precipitation (Inches) | Runoff Coefficient of 1.0 |
|---|---|---|
| 1 | Boulder Creek, 55.9" | 2.04" |
| 2 | La Honda, 24.4" | 0.86" |
| 3 | Half Moon Bay, 25.92" | 0.82" |
| 4 | Pala Alto, 14.4" | 0.44" |
| 5 | San Francisco, 21.0" | 0.73" |
| 6 | San Francisco airport, 20.1" | 0.87" |
| 7 | San Francisco Oceanside, 19.3" | 0.72" |

| | | | |
|---|---|---|---|
| 3-1 | ***Unit basin storage volume from Table 5-3*** *[The coefficient for this method is always 1.0, due to the conversion of any landcaping to effective impervious area.]* | 0.85 | |
| 3-2 | ***Adjusted unit basin storage volume:*** *[The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].]* | 0.93 | Inches |
| 3-3 | ***Required Capture Volume (in cubic feet):*** *[The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet.]* | 1,127 | Cubic feet |

### 4.0 Calculate the Duration of the Rain Event

| | | | |
|---|---|---|---|
| 4-1 | Rainfall Intensity | 0.2 | Inches per hour |
| 4-2 | Divide Item 3-2 by Item 4-1 | 4.65 | Hours of Rain Event Duration |

### 5.0 Preliminary Estimate of Surface Area of Treatment Measure

| | | | |
|---|---|---|---|
| 5-1 | 4% of DMA EIA (Item 2-4) | 581.672 | Square feet |
| 5-2 | Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA) | 436.254 | Square feet |
| 5-3 | Volume of treated runoff for area in Item 5-2 | 845.56 | Cubic feet (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2) |

### 6.0 Initial Adjustment of Depth of Surface Ponding Area

| | | | |
|---|---|---|---|
| 6-1 | Subtract Item 5-3 from Item 3-3 | 281.85 | Cubic feet (Amount of runoff to be stored in ponding area) |
| 6-2 | Divide Item 6-1 by Item 5-2 | 0.65 | Feet (Depth of stored runoff in surface ponding area) |
| 6-3 | Convert Item 6-2 from feet to inches | 7.75 | Inches (Depth of stored runoff in surface ponding area) |
| 6-4 | If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1. *(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)* | | |

### 7.0 Optimize Size of Treatment Measure

| | | | |
|---|---|---|---|
| 7-1 | Enter an area larger than Item 5-2 | 462 | Sq.ft. (enter larger area if you need less ponding depth.) |
| 7-2 | Volume of treated runoff for area in Item 7-1 | 895.46 | Cubic feet (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2) |
| 7-3 | Subtract Item 7-2 from Item 3-3 | 231.95 | Cubic feet (Amount of runoff to be stored in ponding area) |
| 7-4 | Divide Item 7-3 by Item 7-1 | 0.50 | Feet (Depth of stored runoff in surface ponding area) |
| 7-5 | Convert Item 7-4 from ft. to inches | 6.02 | Inches (Depth of stored runoff in surface ponding area) |
| 7-6 | If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth. *(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)* | | |

### 8.0 Surface Area of Treatment Measure for DMA

| | | | |
|---|---|---|---|
| 8-1 | Final surface area of treatment | 462 | **Square feet** (Either Item 5-2 or final amount in Item 7-1) |



## Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

### 1.0 Project Information

| | | |
|---|---|---|
| 1-1 | Project Name: | BURLINGAME COMM CENTER |
| 1-2 | City application ID: | |
| 1-3 | Site Address or APN: | 980-990 BURLINGAME |
| 1-4 | Tract or Parcel Map No: | |
| 1-5 | Rainfall Region | 6 |
| 1-6 | Region Mean Annual Precipitation (MAP) | 20.10 |
| 1-7 | Site Mean Annual Precipitation (MAP) | 22 |
| 1-8 | ***MAP adjustment factor is automatically calculated as:*** | 1.09 |

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 5.0 (2016). The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named 'Guidance from Chapter 5'.

Click here for map

*[The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, shown in Table 5-3, below.]*
*Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.*

### 2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **DMA3**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

| | Type of Surface | Area of surface type within DMA (Sq. Ft.) | Adjust Pervious Surface | Effective Impervious Area |
|---|---|---|---|---|
| 2-2 | Impervious surface | 7,730 | 1.0 | 7,730 |
| 2-3 | Pervious surface | 12,592 | 0.1 | 1,259 |
| | ***Total DMA Area (square feet) =*** | 20,322 | | |
| 2-4 | ***Total Effective Impervious Area (EIA)*** | 8,989 | **Square feet** | |

### 3.0 Calculate Unit Basin Storage Volume in Inches

**Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient**

| Region | Station, and Mean Annual Precipitation (Inches) | Runoff Coefficient of 1.0 |
|---|---|---|
| 1 | Boulder Creek, 55.9" | 2.04" |
| 2 | La Honda, 24.4" | 0.86" |
| 3 | Half Moon Bay, 25.92" | 0.82" |
| 4 | Pala Alto, 14.4" | 0.44" |
| 5 | San Francisco, 21.0" | 0.73" |
| 6 | San Francisco airport, 20.1" | 0.87" |
| 7 | San Francisco Oceanside, 19.3" | 0.72" |

| | | | |
|---|---|---|---|
| 3-1 | ***Unit basin storage volume from Table 5-3*** *[The coefficient for this method is always 1.0, due to the conversion of any landcaping to effective impervious area.]* | 0.85 | |
| 3-2 | ***Adjusted unit basin storage volume:*** *[The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].]* | 0.93 | Inches |
| 3-3 | ***Required Capture Volume (in cubic feet):*** *[The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet.]* | 697 | Cubic feet |

### 4.0 Calculate the Duration of the Rain Event

| | | | |
|---|---|---|---|
| 4-1 | Rainfall Intensity | 0.2 | Inches per hour |
| 4-2 | Divide Item 3-2 by Item 4-1 | 4.65 | Hours of Rain Event Duration |

### 5.0 Preliminary Estimate of Surface Area of Treatment Measure

| | | | |
|---|---|---|---|
| 5-1 | 4% of DMA EIA (Item 2-4) | 359.568 | Square feet |
| 5-2 | Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA) | 269.676 | Square feet |
| 5-3 | Volume of treated runoff for area in Item 5-2 | 522.69 | Cubic feet (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2) |

### 6.0 Initial Adjustment of Depth of Surface Ponding Area

| | | | |
|---|---|---|---|
| 6-1 | Subtract Item 5-3 from Item 3-3 | 174.23 | Cubic feet (Amount of runoff to be stored in ponding area) |
| 6-2 | Divide Item 6-1 by Item 5-2 | 0.65 | Feet (Depth of stored runoff in surface ponding area) |
| 6-3 | Convert Item 6-2 from feet to inches | 7.75 | Inches (Depth of stored runoff in surface ponding area) |
| 6-4 | If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1. *(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)* | | |

### 7.0 Optimize Size of Treatment Measure

| | | | |
|---|---|---|---|
| 7-1 | Enter an area larger than Item 5-2 | 450 | Sq.ft. (enter larger area if you need less ponding depth.) |
| 7-2 | Volume of treated runoff for area in Item 7-1 | 872.20 | Cubic feet (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2) |
| 7-3 | Subtract Item 7-2 from Item 3-3 | -175.28 | Cubic feet (Amount of runoff to be stored in ponding area) |
| 7-4 | Divide Item 7-3 by Item 7-1 | -0.39 | Feet (Depth of stored runoff in surface ponding area) |
| 7-5 | Convert Item 7-4 from ft. to inches | -4.67 | Inches (Depth of stored runoff in surface ponding area) |
| 7-6 | If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth. *(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)* | | |

### 8.0 Surface Area of Treatment Measure for DMA

| | | | |
|---|---|---|---|
| 8-1 | Final surface area of treatment | 450 | **Square feet** (Either Item 5-2 or final amount in Item 7-1) |



## Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

### 1.0 Project Information

| | | |
|---|---|---|
| 1-1 | Project Name: | BURLINGAME COMM CENTER |
| 1-2 | City application ID: | |
| 1-3 | Site Address or APN: | 980-990 BURLINGAME |
| 1-4 | Tract or Parcel Map No: | |
| 1-5 | Rainfall Region | 6 |
| 1-6 | Region Mean Annual Precipitation (MAP) | 20.10 |
| 1-7 | Site Mean Annual Precipitation (MAP) | 22 |
| 1-8 | ***MAP adjustment factor is automatically calculated as:*** | 1.09 |

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 5.0 (2016). The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named 'Guidance from Chapter 5'.

Click here for map

*[The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, shown in Table 5-3, below.]*
*Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.*

### 2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **DMA4**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

| | Type of Surface | Area of surface type within DMA (Sq. Ft.) | Adjust Pervious Surface | Effective Impervious Area |
|---|---|---|---|---|
| 2-2 | Impervious surface | 9,397 | 1.0 | 9,397 |
| 2-3 | Pervious surface | 8,081 | 0.1 | 808 |
| | ***Total DMA Area (square feet) =*** | 17,478 | | |
| 2-4 | ***Total Effective Impervious Area (EIA)*** | 10,205 | **Square feet** | |

### 3.0 Calculate Unit Basin Storage Volume in Inches

**Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient**

| Region | Station, and Mean Annual Precipitation (Inches) | Runoff Coefficient of 1.0 |
|---|---|---|
| 1 | Boulder Creek, 55.9" | 2.04" |
| 2 | La Honda, 24.4" | 0.86" |
| 3 | Half Moon Bay, 25.92" | 0.82" |
| 4 | Pala Alto, 14.4" | 0.44" |
| 5 | San Francisco, 21.0" | 0.73" |
| 6 | San Francisco airport, 20.1" | 0.87" |
| 7 | San Francisco Oceanside, 19.3" | 0.72" |

| | | | |
|---|---|---|---|
| 3-1 | ***Unit basin storage volume from Table 5-3*** *[The coefficient for this method is always 1.0, due to the conversion of any landcaping to effective impervious area.]* | 0.85 | |
| 3-2 | ***Adjusted unit basin storage volume:*** *[The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].]* | 0.93 | Inches |
| 3-3 | ***Required Capture Volume (in cubic feet):*** *[The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet.]* | 791 | Cubic feet |

### 4.0 Calculate the Duration of the Rain Event

| | | | |
|---|---|---|---|
| 4-1 | Rainfall Intensity | 0.2 | Inches per hour |
| 4-2 | Divide Item 3-2 by Item 4-1 | 4.65 | Hours of Rain Event Duration |

### 5.0 Preliminary Estimate of Surface Area of Treatment Measure

| | | | |
|---|---|---|---|
| 5-1 | 4% of DMA EIA (Item 2-4) | 408.204 | Square feet |
| 5-2 | Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA) | 306.153 | Square feet |
| 5-3 | Volume of treated runoff for area in Item 5-2 | 593.39 | Cubic feet (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2) |

### 6.0 Initial Adjustment of Depth of Surface Ponding Area

| | | | |
|---|---|---|---|
| 6-1 | Subtract Item 5-3 from Item 3-3 | 197.80 | Cubic feet (Amount of runoff to be stored in ponding area) |
| 6-2 | Divide Item 6-1 by Item 5-2 | 0.65 | Feet (Depth of stored runoff in surface ponding area) |
| 6-3 | Convert Item 6-2 from feet to inches | 7.75 | Inches (Depth of stored runoff in surface ponding area) |
| 6-4 | If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1. *(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)* | | |

### 7.0 Optimize Size of Treatment Measure

| | | | |
|---|---|---|---|
| 7-1 | Enter an area larger than Item 5-2 | 315 | Sq.ft. (enter larger area if you need less ponding depth.) |
| 7-2 | Volume of treated runoff for area in Item 7-1 | 610.54 | Cubic feet (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2) |
| 7-3 | Subtract Item 7-2 from Item 3-3 | 180.65 | Cubic feet (Amount of runoff to be stored in ponding area) |
| 7-4 | Divide Item 7-3 by Item 7-1 | 0.57 | Feet (Depth of stored runoff in surface ponding area) |
| 7-5 | Convert Item 7-4 from ft. to inches | 6.88 | Inches (Depth of stored runoff in surface ponding area) |
| 7-6 | If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth. *(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)* | | |

### 8.0 Surface Area of Treatment Measure for DMA

| | | | |
|---|---|---|---|
| 8-1 | Final surface area of treatment | 315 | **Square feet** (Either Item 5-2 or final amount in Item 7-1) |



**LID TREATMENT CONTROL MEASURE SUMMARY TABLE**

| DRAINAGE AREAS | DRAINAGE AREA SIZE (SQ. FT.) | PERVIOUS SURFACE (SQ. FT.) | TYPE OF PERVIOUS SURFACE | IMPERVIOUS SURFACE (SQ. FT.) | TYPE OF IMPERVIOUS SURFACE | WATER QUANTITY (FLOW AND/OR VOLUME GENERATED) | | PROPOSED TREATMENT CONTROLS | CONFORMS TO SIZE STANDARD? |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REQUIRED (SF) | PROVIDED (SF) | | |
| DMA 1 | 15,067 | 5,120 | BIORETENTION BASIN LANDSCAPE | 9,947 | CONCRETE ASPHALT CONCRETE | 286 | 320 | BIORETENTION BASIN | YES |
| DMA 2 | 21,695 | 7,948 | BIORETENTION BASIN LANDSCAPE | 13,747 | ASPHALT CONCRETE ROOF | 466 | 462 | BIORETENTION BASIN | YES |
| DMA 3 | 20,322 | 12,592 | BIORETENTION BASIN LANDSCAPE | 7.730 | CONCRETE ASPHALT CONCRETE | 270 | 450 | BIORETENTION BASIN | YES |
| DMA 4 | 17,478 | 8,081 | BIORETENTION BASIN LANDSCAPE | 9,397 | ASPHALT CONCRETE ROOF | 306 | 315 | BIORETENTION BASIN | YES |
| DMA 5 | 8,833 | 2,324 | BIORETENTION BASIN LANDSCAPE | 6,509 | ASPHALT CONCRETE ROOF | 202 | 339 | BIORETENTION BASIN | YES |
| DMA 6 | 6,665 | 2,165 | BIORETENTION BASIN LANDSCAPE | 4,500 | CONCRETE ROOF | 141 | 549 | BIORETENTION BASIN | YES |
| DMA 7 | 27,946 | 3,750 | BIORETENTION BASIN LANDSCAPE | 24,196 | ASPHALT CONCRETE ROOF | 737 | 755 | BIORETENTION BASIN | YES |
| DMA 8 | 12,478 | 1,675 | BIORETENTION BASIN LANDSCAPE | 10,803 | ASPHALT CONCRETE CONCRETE | 329 | 366 | BIORETENTION BASIN | YES |
| DMA 9 | 5,273 | 782 | BIORETENTION BASIN LANDSCAPE | 4,491 | ASPHALT CONCRETE CONCRETE | 137 | 172 | BIORETENTION BASIN | YES |

**PACKAGE 1**

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P ARCHITECTURE
RESEARCH +
PLANNING, INC
211 LINDEN AVENUE
SO. SAN FRANCISCO
C A 94080 USA
650 871 0709

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ENGINEERS | SURVEYORS | PLANNERS
1730 N. FIRST ST.
SUITE 600
SAN JOSE, CA 95112
408-467-9100
408-467-9199 (FAX)

THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

**WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA**

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

REGISTERED PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA

| | |
|---|---|
| Project Arch. | ---- |
| CA REG. | ---- |
| PROJECT: | 12421-04 |

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| ⚠1 ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.

STORM WATER CONTROL DETAILS

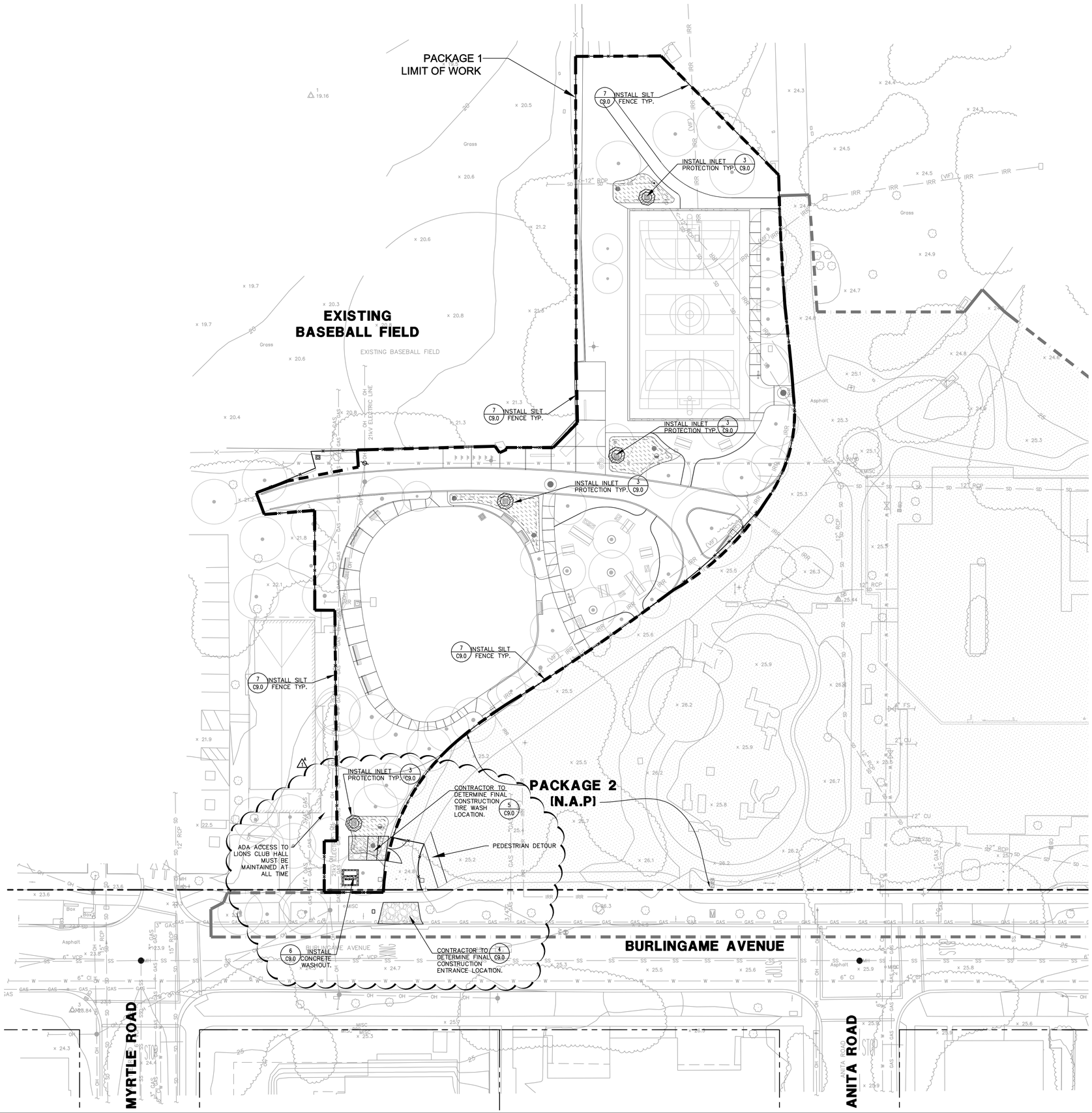
C7.0

## EROSION CONTROL LEGEND

- PROPERTY LINE
- ADJACENT LOT LINE
- FIBER ROLL PER DETAIL 1, SHEET C9.1
- TEMPORARY SILT CONSTRUCTION FENCE
- INLET PROTECTION (TYPE A) PER DETAIL 2, SHEET C9.1
- INLET PROTECTION (TYPE B) PER DETAIL 3, SHEET C9.0
- STABILIZED CONSTRUCTION ENTRANCE/EXIT PER DETAIL 4, SHEET C9.1
- OUTLET TIRE WASH PER DETAIL 5, SHEET C9.1
- CONCRETE WASTE MANAGEMENT PER DETAIL 6, SHEET C9.1

## GENERAL NOTE

CONTRACTOR TO PROVIDE LOGISTICS PLAN FOR THE CONSTRUCTION PHASE. LOGISTICS PLAN TO BE SUBMITTED TO THE CITY OF BURLINGAME FOR REVIEW AND APPROVAL. LOGISTICS PLANS TO INCLUDE PEDESTRIAN ACCESS TO THE PORTION OF THE PARK TO REMAIN OPEN, ACCESS TO THE EXISTING BATHROOM AND BASEBALL FIELD.




GRAPHIC SCALE

( IN FEET )
1 inch = 20 ft.

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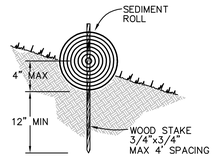
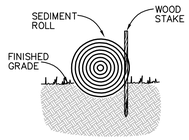
SHEET TITLE AND NO.

EROSION CONTROL PLAN

C8.0




ENTRENCHMENT DETAIL IN SLOPE AREA



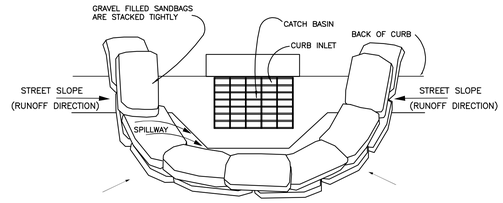

ENTRENCHMENT DETAIL IN FLAT AREA

**NOTES:**

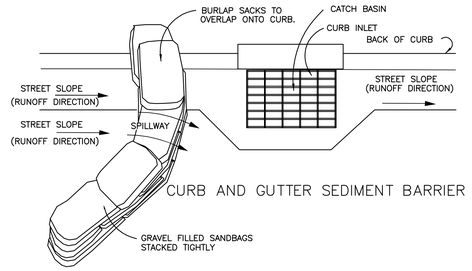
1. USE REED & GRAHAM, INC. GEOSYNTHETICS STRAW WATTLE FIBER ROLL (COMES IN 9" X 25' ROLLS) OR APPROVED EQUIVALENT.
2. FIBER ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE FIBER ROLL IN A TRENCH, 3" – 5" DEEP, DUG ON CONTOUR.
3. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND FIBER ROLL. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BY-PASSING THE INLET.
4. EXCAVATION OF A BASIN ADJACENT TO THE DROP INLET OR A TEMPORARY DIKE ON THE DOWNSLOPE OF THE STRUCTURE MAY BE NECESSARY. IN PAVED AREAS, USE SAND BAGS TO SECURE FIBER ROLLS IN PLACE OF WOOD STAKE.

## 1 – FIBER ROLL

SCALE: NTS




CURB INLET SEDIMENT BARRIER



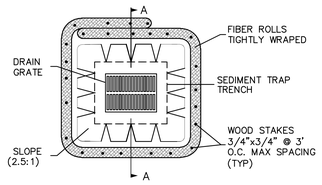

CURB AND GUTTER SEDIMENT BARRIER

**NOTES:**

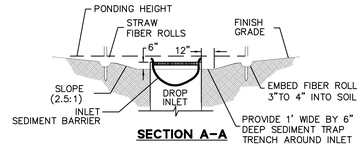
1. PLACE CURB TYPE SEDIMENT BARRIERS ON GENTLY SLOPING STREETS, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. SANDBAGS OF EITHER BURLAP OR WOVEN GEOTEXTILE FABRIC, ARE FILLED WITH GRAVEL, LAYERED AND PACKED TIGHTLY
3. LEAVE ONE SANDBAG GAP IN THE TOP ROW TO PROVIDE A SPILLWAY OVERFLOW. TOP OF SPILLWAY SHALL BE LOWER THAN TOP OF CURB.
4. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT, SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

## 2 – INLET PROTECTION (TYPE A)

SCALE: NTS




**PLAN VIEW**



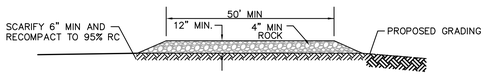

**SECTION A–A**

**NOTE:**

1. PLACE FIBER ROLLS AROUND THE INLET CONSISTENT WITH BASIN SEDIMENT BARRIER DETAIL ON THE SHEET. FIBER ROLLS ARE TUBES MADE FROM STRAW BOUND WITH PLASTIC NETTING. THEY ARE APPROXIMATELY 8" DIAMETER AND 20–30 FEET LONG.

## 3 – INLET PROTECTION (TYPE B)

SCALE: NTS

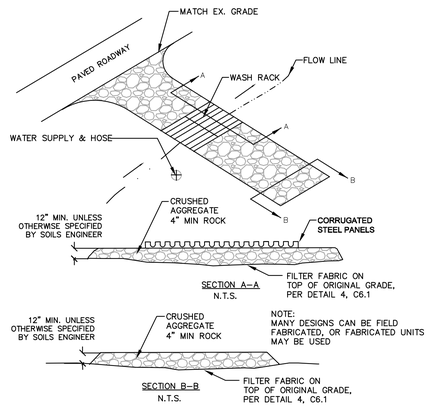



NOTES:

1. THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE DESIGNED AND MAINTAINED IAW 2010 CFC, CHAPTER 5, 503.2.3.MVW 45,000 LBS.
2. SCARIFY THE TOP 6" OF SUBGRADE AND RECOMPACT TO AT LEAST 95% RELATIVE COMPACTION.
3. THE LOCATIONS SHOWN ARE FOR INFORMATION ONLY. CONSTRUCTION ENTRANCES SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL ROCK AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAYS SHALL BE REMOVED IMMEDIATELY.
4. WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAYS. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED ROCK THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. SEDIMENT SHALL BE PREVENTED FROM ENTERING THE STORM DRAIN, DITCH OR WATERCOURSE THROUGH USE OF INLET PROTECTION (E.G. GRAVELBAGS OR OTHER APPROVED METHODS).
5. THE MATERIAL FOR CONSTRUCTION OF THE PAD SHALL BE 4" MIN ROCK.
6. THE THICKNESS OF THE PAD SHALL NOT BE LESS THAN 12". THE WIDTH OF THE PAD SHALL NOT BE LESS THAN THE FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS, OR 25', WHICHEVER IS LESS.
7. THE LENGTH OF THE PAD SHALL NOT BE LESS THAN 50'.

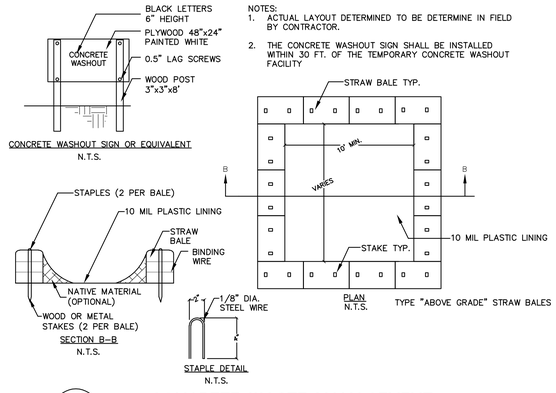
## 4 – STABILIZED CONSTRUCTION ENTRANCE/EXIT

SCALE: NTS



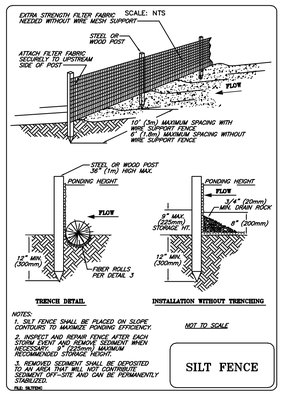

## 5 – OUTLET TIRE WASH

SCALE: NTS




## 6 – CONCRETE WASTE MANAGEMENT

SCALE: NTS




## 7 – SILT FENCE

SCALE: NTS

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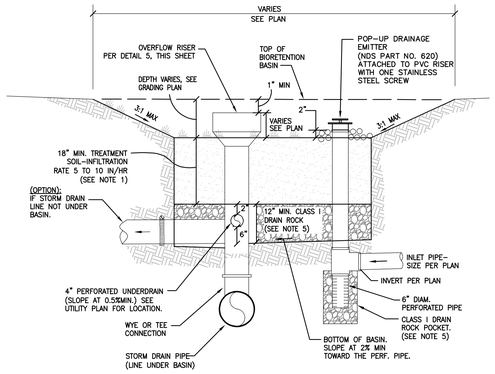
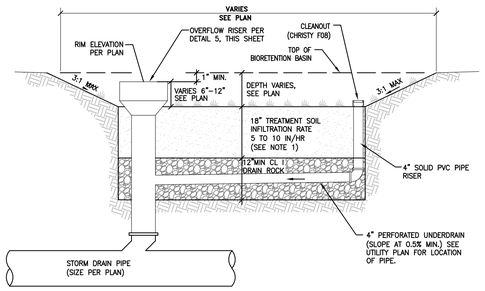
SHEET TITLE AND NO.

EROSION CONTROL DETAILS

C9.0




**TRANSVERSE SECTION - CASE 2 (BUBBLER ASS'Y WITHIN BIORETENTION)**




**LONGITUDINAL SECTION**

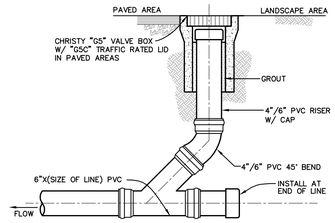
N.T.S.

NOTE:

1. FOR TREATMENT SOIL SPECIFICATION, SEE APPENDIX C IN SCVURPPP C3 STORMWATER HANDBOOK DATED APRIL 2016.
2. BACKFILL BIORETENTION ONLY WITH PERMEABLE PLANTING MATERIAL AND DRAIN ROCK AS SPECIFIED IN THIS DETAIL. ABSOLUTELY NO NATIVE MATERIAL SHALL BE USED FOR BACKFILL. CONTRACTOR MUST COORDINATE WITH CIVIL ENGINEER PRIOR TO CONSTRUCTION.
3. CONTACT THE CITY'S URBAN RUNOFF COORDINATOR FOR INSPECTION DURING INSTALLATION OF BIOTREATMENT SOIL, OF THE TREE POD SYSTEM, AND FINAL LANDSCAPING. RESULT FROM A PERCOLATION RATE SHALL BE GREATER THAN 5.0 IN/HR AND LESS THAN 10.0 IN/HR.
4. A MINIMUM 2-FOOT LEVEL CLEARANCE (MAX 2%) SHALL BE PROVIDE BETWEEN THE TOP OF BASIN AND WALKWAYS/PUBLIC SIDEWALKS.
5. DRAIN ROCK TO BE CLASS 1 PERMEABLE MATERIAL PER CALTRANS STANDARD SPECIFICATIONS, SECTION 68-2.02F.
6. PERFORATED PIPE SHALL BE SOLVENT WELD PVC SDR 35 (OR APPROVED EQUAL) WITH PERFORATIONS FACED DOWN. LOCATION OF THE PIPE VARIES, SEE PLAN.
7. FOR ANY HORIZONTAL LINER PENETRATIONS, RADIAL-CUT THE LINER FOR PIPE. MASTIC AND SEAL WITH PIPE CLAMP TO INSURE WATER-TIGHT SEAL.

NOT TO SCALE

## 1 BIORETENTION BASIN




NOTES:

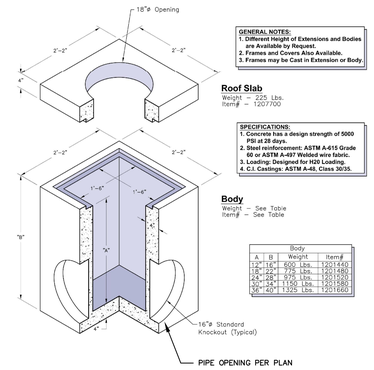
1. ALL PVC PIPE TO BE SDR 35.
2. LIDS SHALL BE MARKED "SD" FOR STORM DRAIN AND "SS" FOR SANITARY SEWER.
3. INSTALL H20 TRAFFIC LOADING FRAME & COVER WHEN CLEAN-OUTS ARE SUBJECT TO VEHICULAR TRAFFIC

NOT TO SCALE

## 2 STORM DRAIN/SANITARY SEWER CLEAN OUT

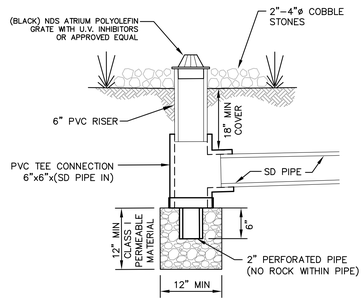
Oldcastle Precast | Water

**1'-6"x1'-6" I.D. Junction Box**
Model: JB-1818

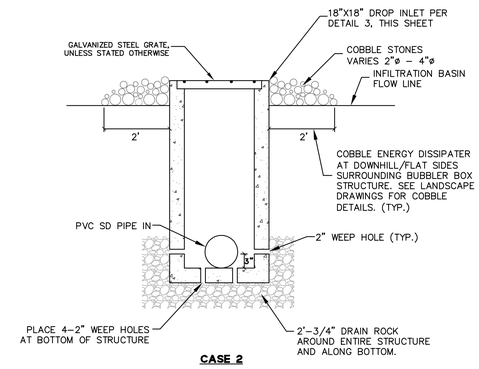



NOT TO SCALE

## 3 STORM DRAIN JUNCTION BOX / DROP INLET



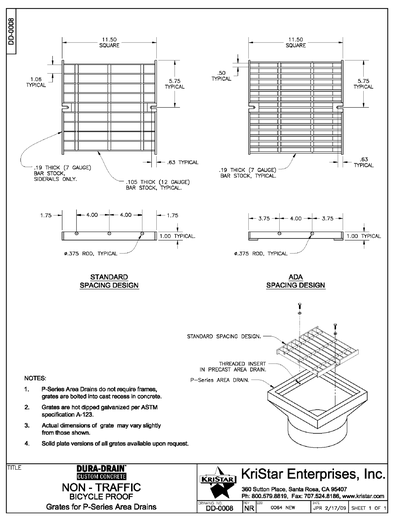

**CASE 1**




**CASE 2**

NOT TO SCALE

## 4 STORM DRAIN BUBBLER BOX

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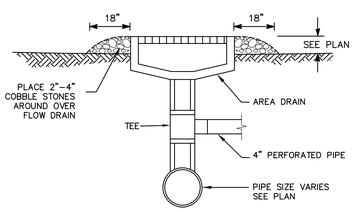
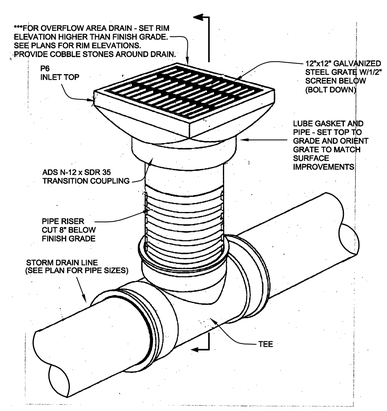



**SECTION A-A**

NTS




## 5 OVERFLOW DRAIN RISER AT BIORETENTION BASIN

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**850 BURLINGAME AVE**
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REGISTERED PROFESSIONAL ENGINEER
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STATE OF CALIFORNIA

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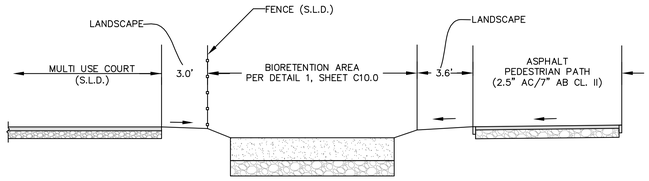
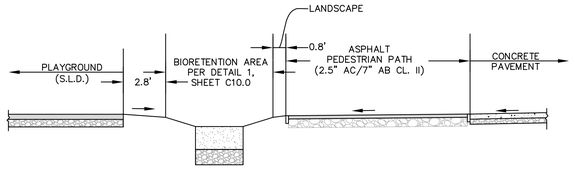
SHEET TITLE AND NO.

CONSTRUCTION DETAILS

C10.0




SECTION A
SCALE: 1"=4'




SECTION B
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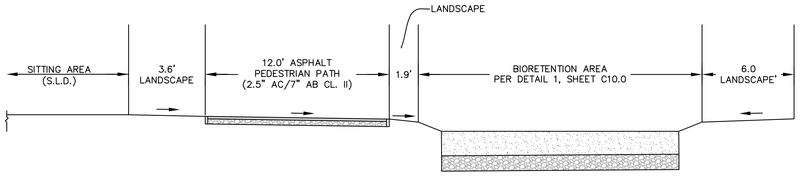
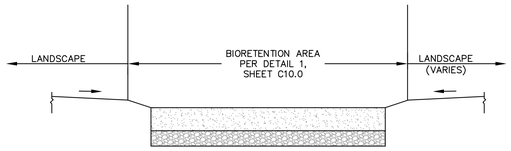



SECTION C
SCALE: 1"=4'




SECTION D
SCALE: 1"=4'

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CROSS SECTIONS

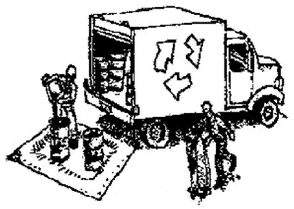
C11.0

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

# Construction Best Management Practices (BMPs)

Construction projects are required to implement the stormwater best management practices (BMP) on this page, as they apply to your project, all year long.

## Materials & Waste Management



**Non-Hazardous Materials**

- ❑ Berm and cover stockpiles of sand, dirt or other construction material with tarps when rain is forecast or if not actively being used within 14 days.
- ❑ Use (but don't overuse) reclaimed water for dust control.

**Hazardous Materials**

- ❑ Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, county, state and federal regulations.
- ❑ Store hazardous materials and wastes in water tight containers, store in appropriate secondary containment, and cover them at the end of every work day or during wet weather or when rain is forecast.
- ❑ Follow manufacturer's application instructions for hazardous materials and be careful not to use more than necessary. Do not apply chemicals outdoors when rain is forecast within 24 hours.
- ❑ Arrange for appropriate disposal of all hazardous wastes.

**Waste Management**

- ❑ Cover waste disposal containers securely with tarps at the end of every work day and during wet weather.
- ❑ Check waste disposal containers frequently for leaks and to make sure they are not overfilled. Never hose down a dumpster on the construction site.
- ❑ Clean or replace portable toilets, and inspect them frequently for leaks and spills.
- ❑ Dispose of all wastes and debris properly. Recycle materials and wastes that can be recycled (such as asphalt, concrete, aggregate base materials, wood, gyp board, pipe, etc.)
- ❑ Dispose of liquid residues from paints, thinners, solvents, glues, and cleaning fluids as hazardous waste.

**Construction Entrances and Perimeter**

- ❑ Establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from site and tracking off site.
- ❑ Sweep or vacuum any street tracking immediately and secure sediment source to prevent further tracking. Never hose down streets to clean up tracking.

## Equipment Management & Spill Control

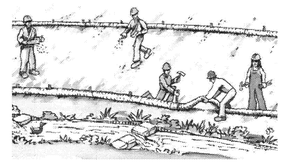
**Maintenance and Parking**

- ❑ Designate an area, fitted with appropriate BMPs, for vehicle and equipment parking and storage.
- ❑ Perform major maintenance, repair jobs, and vehicle and equipment washing off site.
- ❑ If refueling or vehicle maintenance must be done onsite, work in a bermed area away from storm drains and over a drip pan or drop cloths big enough to collect fluids. Recycle or dispose of fluids as hazardous waste.
- ❑ If vehicle or equipment cleaning must be done onsite, clean with water only in a bermed area that will not allow rinse water to run into gutters, streets, storm drains, or surface waters.
- ❑ Do not clean vehicle or equipment onsite using soaps, solvents, degreasers, or steam cleaning equipment.

**Spill Prevention and Control**

- ❑ Keep spill cleanup materials (e.g., rags, absorbents and cat litter) available at the construction site at all times.
- ❑ Inspect vehicles and equipment frequently for and repair leaks promptly. Use drip pans to catch leaks until repairs are made.
- ❑ Clean up spills or leaks immediately and dispose of cleanup materials properly.
- ❑ Do not hose down surfaces where fluids have spilled. Use dry cleanup methods (absorbent materials, cat litter, and/or rags).
- ❑ Sweep up spilled dry materials immediately. Do not try to wash them away with water, or bury them.
- ❑ Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.
- ❑ Report significant spills immediately. You are required by law to report all significant releases of hazardous materials, including oil. To report a spill: 1) Dial 911 or your local emergency response number, 2) Call the Governor's Office of Emergency Services Warning Center, (800) 852-7550 (24 hours).

## Earthmoving



- ❑ Schedule grading and excavation work during dry weather.
- ❑ Stabilize all denuded areas, install and maintain temporary erosion controls (such as erosion control fabric or bonded fiber matrix) until vegetation is established.
- ❑ Remove existing vegetation only when absolutely necessary, and seed or plant vegetation for erosion control on slopes or where construction is not immediately planned.
- ❑ Prevent sediment from migrating offsite and protect storm drain inlets, gutters, ditches, and drainage courses by installing and maintaining appropriate BMPs, such as fiber rolls, silt fences, sediment basins, gravel bags, berms, etc.
- ❑ Keep excavated soil on site and transfer it to dump trucks on site, not in the streets.

**Contaminated Soils**

- ❑ If any of the following conditions are observed, test for contamination and contact the Regional Water Quality Control Board:
  - Unusual soil conditions, discoloration, or odor.
  - Abandoned underground tanks.
  - Abandoned wells
  - Buried barrels, debris, or trash.

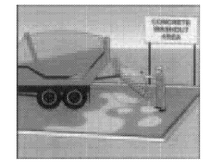
## Paving/Asphalt Work

- ❑ Avoid paving and seal coating in wet weather or when rain is forecast, to prevent materials that have not cured from contacting stormwater runoff.
- ❑ Cover storm drain inlets and manholes when applying seal coat, tack coat, slurry seal, fog seal, etc.
- ❑ Collect and recycle or appropriately dispose of excess abrasive gravel or sand. Do NOT sweep or wash it into gutters.
- ❑ Do not use water to wash down fresh asphalt concrete pavement.

**Sawcutting & Asphalt/Concrete Removal**

- ❑ Protect nearby storm drain inlets when saw cutting. Use filter fabric, catch basin inlet filters, or gravel bags to keep slurry out of the storm drain system.
- ❑ Shovel, abosorb, or vacuum saw-cut slurry and dispose of all waste as soon as you are finished in one location or at the end of each work day (whichever is sooner!).
- ❑ If sawcut slurry enters a catch basin, clean it up immediately.

## Concrete, Grout & Mortar Application

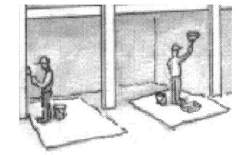


- ❑ Store concrete, grout, and mortar away from storm drains or waterways, and on pallets under cover to protect them from rain, runoff, and wind.
- ❑ Wash out concrete equipment/trucks offsite or in a designated washout area, where the water will flow into a temporary waste pit, and in a manner that will prevent leaching into the underlying soil or onto surrounding areas. Let concrete harden and dispose of as garbage.
- ❑ When washing exposed aggregate, prevent washwater from entering storm drains. Block any inlets and vacuum gutters, hose washwater onto dirt areas, or drain onto a bermed surface to be pumped and disposed of properly.

## Landscaping

- ❑ Protect stockpiled landscaping materials from wind and rain by storing them under tarps all year-round.
- ❑ Stack bagged material on pallets and under cover.
- ❑ Discontinue application of any erodible landscape material within 2 days before a forecast rain event or during wet weather.

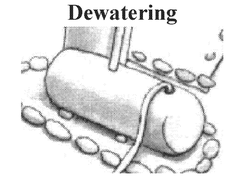
## Painting & Paint Removal



**Painting Cleanup and Removal**

- ❑ Never clean brushes or rinse paint containers into a street, gutter, storm drain, or stream.
- ❑ For water-based paints, paint out brushes to the extent possible, and rinse into a drain that goes to the sanitary sewer. Never pour paint down a storm drain.
- ❑ For oil-based paints, paint out brushes to the extent possible and clean with thinner or solvent in a proper container. Filter and reuse thinners and solvents. Dispose of excess liquids as hazardous waste.
- ❑ Paint chips and dust from non-hazardous dry stripping and sand blasting may be swept up or collected in plastic drop cloths and disposed of as trash.
- ❑ Chemical paint stripping residue and chips and dust from marine paints or paints containing lead, mercury, or tributyltin must be disposed of as hazardous waste. Lead based paint removal requires a state-certified contractor.

## Dewatering



- ❑ Discharges of groundwater or captured runoff from dewatering operations must be properly managed and disposed. When possible send dewatering discharge to landscaped area or sanitary sewer. If discharging to the sanitary sewer call your local wastewater treatment plant.
- ❑ Divert run-on water from offsite away from all disturbed areas.
- ❑ When dewatering, notify and obtain approval from the local municipality before discharging water to a street gutter or storm drain. Filtration or diversion through a basin, tank, or sediment trap may be required.
- ❑ In areas of known or suspected contamination, call your local agency to determine whether the ground water must be tested. Pumped groundwater may need to be collected and hauled off-site for treatment and proper disposal.

**Storm drain polluters may be liable for fines of up to $10,000 per day!**

PACKAGE 1


GROUP ARCHITECTURE RESEARCH + PLANNING, INC
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THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

**WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA**

850 BURLINGAME AVE
BURLINGAME
CA 94010

REGISTERED PROFESSIONAL ENGINEER CIVIL STATE OF CALIFORNIA

| | |
|---|---|
| Project Arch. | ---- |
| CA REG. | ---- |
| PROJECT: | 12421-04 |

| ISSUE | DATE |
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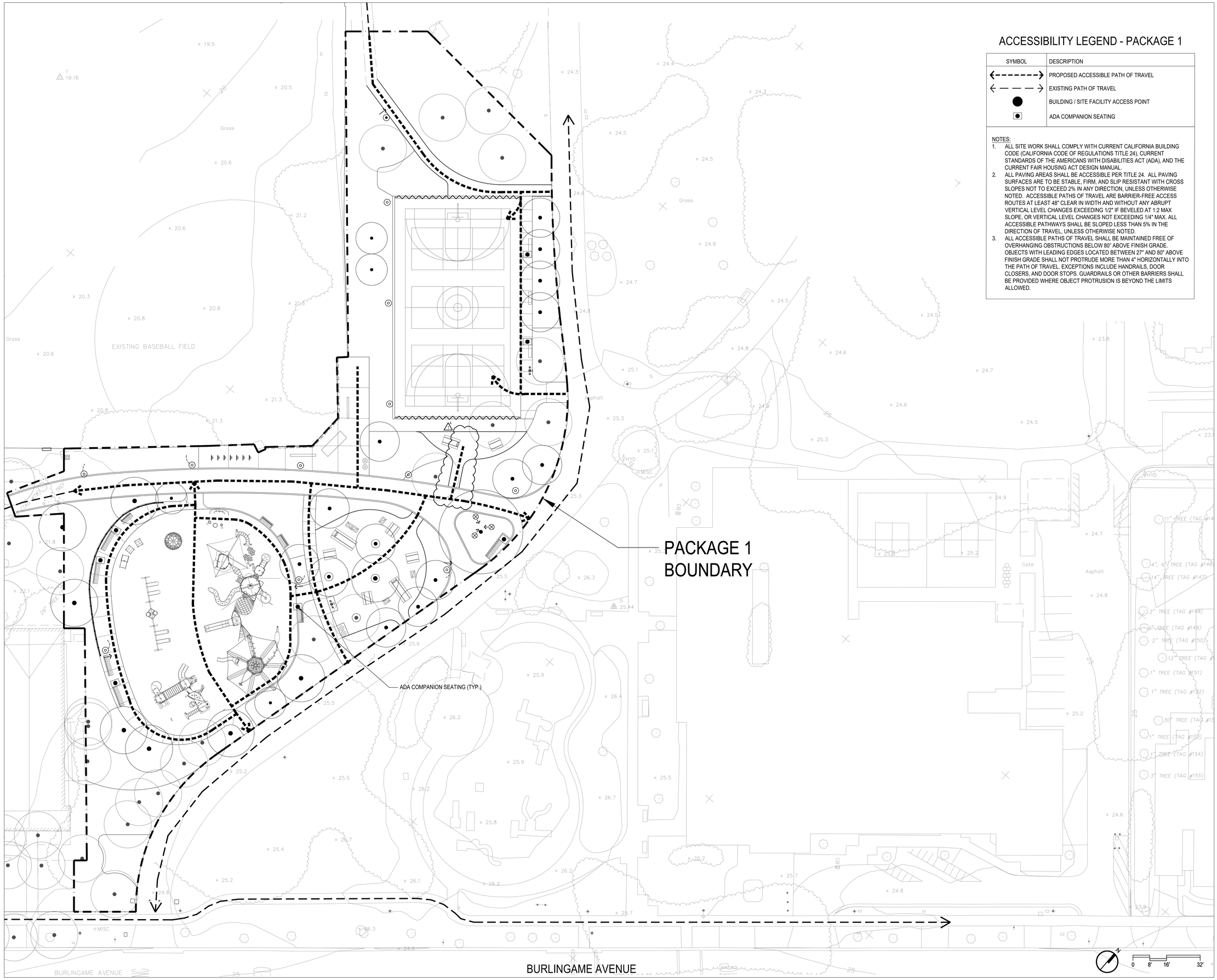
| SCHEMATIC DESIGN | 11/02/18 |
| BID SET | 3/25/19 |
| 1 ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.

BEST MANAGEMENT PRACTICES

C12.0




## ACCESSIBILITY LEGEND - PACKAGE 1

| SYMBOL | DESCRIPTION |
|---|---|
| | PROPOSED ACCESSIBLE PATH OF TRAVEL |
| | EXISTING PATH OF TRAVEL |
| | BUILDING / SITE FACILITY ACCESS POINT |
| | ADA COMPANION SEATING |

NOTES:

1. ALL SITE WORK SHALL COMPLY WITH CURRENT CALIFORNIA BUILDING CODE (CALIFORNIA CODE OF REGULATIONS TITLE 24), CURRENT STANDARDS OF THE AMERICANS WITH DISABILITIES ACT (ADA), AND THE CURRENT FAIR HOUSING ACT DESIGN MANUAL.
2. ALL PAVING AREAS SHALL BE ACCESSIBLE PER TITLE 24. ALL PAVING SURFACES ARE TO BE STABLE, FIRM, AND SLIP RESISTANT WITH CROSS SLOPES NOT TO EXCEED 2% IN ANY DIRECTION, UNLESS OTHERWISE NOTED. ACCESSIBLE PATHS OF TRAVEL ARE BARRIER-FREE ACCESS ROUTES AT LEAST 48" CLEAR IN WIDTH AND WITHOUT ANY ABRUPT VERTICAL LEVEL CHANGES EXCEEDING 1/2" IF BEVELED AT 1:2 MAX SLOPE, OR VERTICAL LEVEL CHANGES NOT EXCEEDING 1/4" MAX. ALL ACCESSIBLE PATHWAYS SHALL BE SLOPED LESS THAN 5% IN THE DIRECTION OF TRAVEL, UNLESS OTHERWISE NOTED.
3. ALL ACCESSIBLE PATHS OF TRAVEL SHALL BE MAINTAINED FREE OF OVERHANGING OBSTRUCTIONS BELOW 80" ABOVE FINISH GRADE. OBJECTS WITH LEADING EDGES LOCATED BETWEEN 27" AND 80" ABOVE FINISH GRADE SHALL NOT PROTRUDE MORE THAN 4" HORIZONTALLY INTO THE PATH OF TRAVEL. EXCEPTIONS INCLUDE HANDRAILS, DOOR CLOSERS, AND DOOR STOPS. GUARDRAILS OR OTHER BARRIERS SHALL BE PROVIDED WHERE OBJECT PROTRUSION IS BEYOND THE LIMITS ALLOWED.

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THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

# WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

LICENSED LANDSCAPE ARCHITECT
Signature
06/06/19
Renewal Date
03/26/19
Date
STATE OF CALIFORNIA

| | |
|---|---|
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| CA REG. | ---- |
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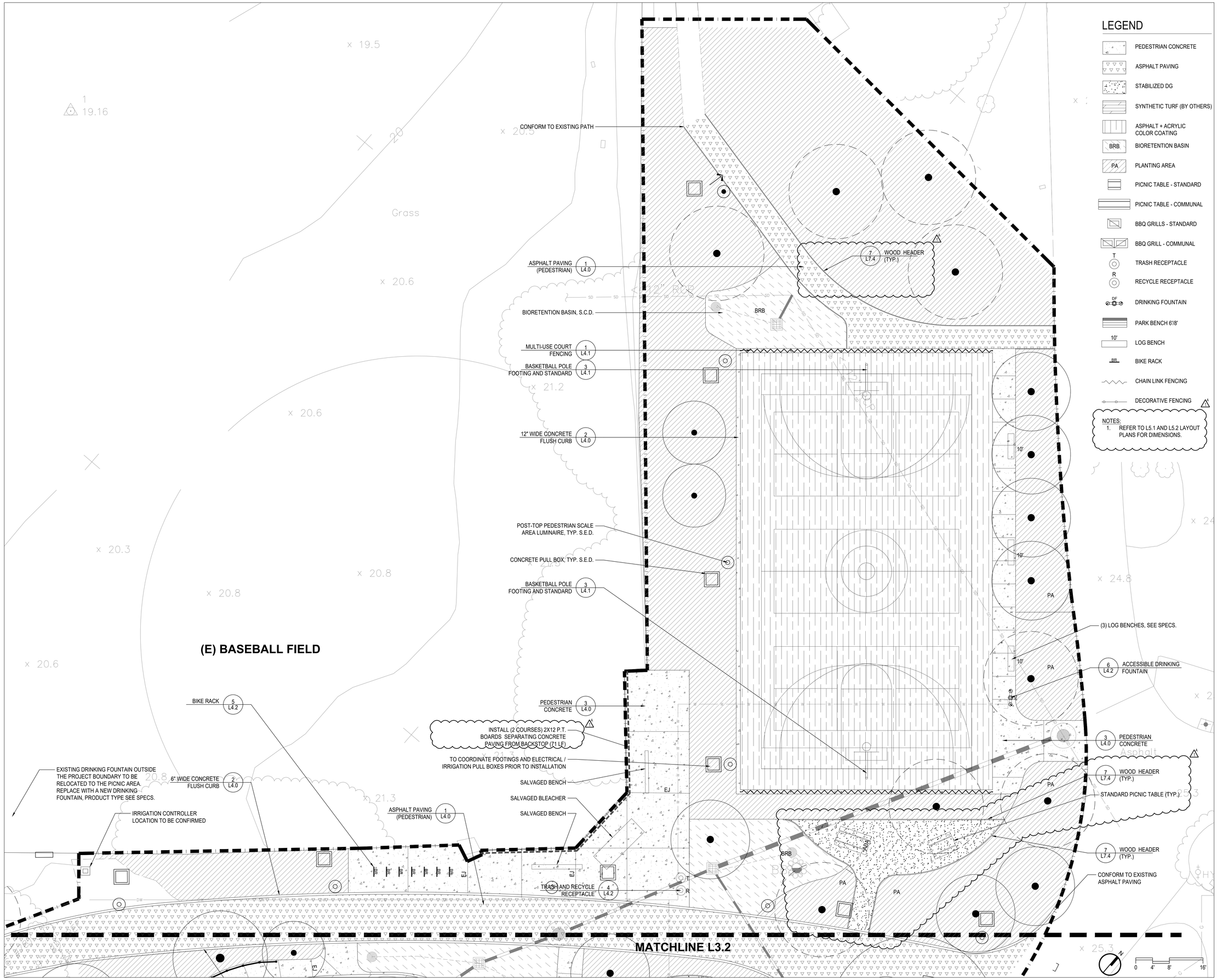
SHEET TITLE AND NO.
**ACCESSIBILITY PLAN**

**L2.0**




## LEGEND

- PEDESTRIAN CONCRETE
- ASPHALT PAVING
- STABILIZED DG
- SYNTHETIC TURF (BY OTHERS)
- ASPHALT + ACRYLIC COLOR COATING
- BRB — BIORETENTION BASIN
- PA — PLANTING AREA
- PICNIC TABLE - STANDARD
- PICNIC TABLE - COMMUNAL
- BBQ GRILLS - STANDARD
- BBQ GRILL - COMMUNAL
- T — TRASH RECEPTACLE
- R — RECYCLE RECEPTACLE
- DF — DRINKING FOUNTAIN
- PARK BENCH 6'/8'
- 10' — LOG BENCH
- BR — BIKE RACK
- CHAIN LINK FENCING
- DECORATIVE FENCING

NOTES:
1. REFER TO L5.1 AND L5.2 LAYOUT PLANS FOR DIMENSIONS.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# WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

LICENSED LANDSCAPE ARCHITECT
Nathan Lindsay
Signature
04/26/19
Renewal Date
03/29/19
Date
STATE OF CALIFORNIA

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SHEET TITLE AND NO.
**CONSTRUCTION PLAN**

**L3.1**

MATCHLINE L3.1

CONFORM TO EXISTING ASPHALT PAVING

2 L4.0 6" WIDE CONCRETE FLUSH CURB

8 L4.0 CONCRETE EDGE AT DECORATIVE FENCE

2 L4.1 DECORATIVE FENCING

CONCRETE PULL BOX, TYP. S.E.D.

POST-TOP PEDESTRIAN SCALE AREA LUMINAIRE, TYP. S.E.D.

(E) LIONS CLUB

PLAYGROUND EQUIPMENT BY OTHERS, INSTALLATION AND SCHEDULE SEE SPECS.

2" WATER METER AND BACKFLOW FOR IRRIGATION, SEE L6.2

(E) PLAYGROUND

2 L4.0 CONCRETE FLUSH CURB

COMPANION SEATING, SEE L2.0

STANDARD PICNIC TABLE (TYP.)

2 L4.2 PARK BENCH 6'/8'

8 L4.2 PARK GRILL

8 L7.4 METAL HEADER

7 L4.2 ACCESSIBLE PICNIC TABLE

7 L4.0 STABILIZED DECOMPOSED GRANITE

6 L4.2 RELOCATED ACCESSIBLE DRINKING FOUNTAIN

7 L7.4 WOOD HEADER (TYP.)

4 L4.2 TRASH AND RECYCLE RECEPTACLE

2 L4.2 PARK BENCH 6'/8'

3 L4.0 PEDESTRIAN CONCRETE

6 L4.0 CONCRETE-SYNTHETIC TURF EDGE

5 L4.0 SYNTHETIC TURF AND BASE COURSE

3 L4.0 PEDESTRIAN CONCRETE

BURLINGAME AVENUE

## LEGEND

- PEDESTRIAN CONCRETE
- ASPHALT PAVING
- STABILIZED DG
- SYNTHETIC TURF (BY OTHERS)
- ASPHALT + ACRYLIC COLOR COATING
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- DF DRINKING FOUNTAIN
- PARK BENCH 6'/8'
- 10' LOG BENCH
- BR BIKE RACK
- CHAIN LINK FENCING
- DECORATIVE FENCING

NOTES:
1. REFER TO L5.1 AND L5.2 LAYOUT PLANS FOR DIMENSIONS.

0 4' 8' 16'


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# WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA

850 BURLINGAME AVE
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CA 94010

LICENSED LANDSCAPE ARCHITECT
Matthew Lindstrom
Signature
04/30/19
Renewal Date
05/25/19
Date
STATE OF CALIFORNIA

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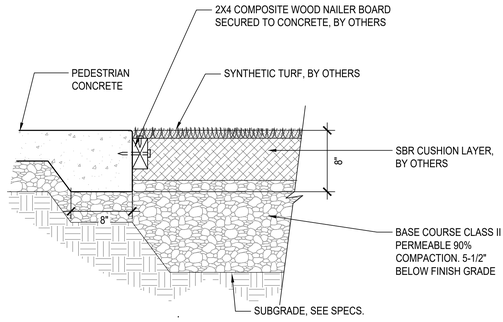
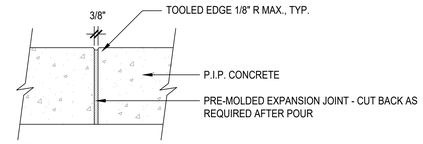
SHEET TITLE AND NO.
CONSTRUCTION PLAN

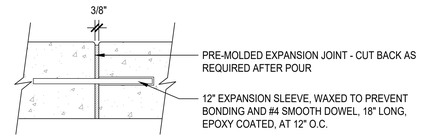
L3.2



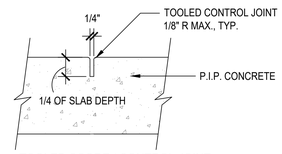

## 6 CONRETE-SYNTHETIC TURF EDGE
1-1/2" = 1'-0"




EXPANSION JOINT



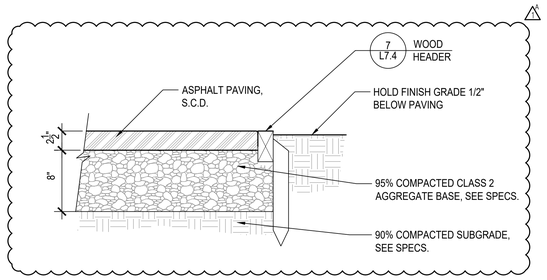

DOWEL AT EXPANSION JOINT



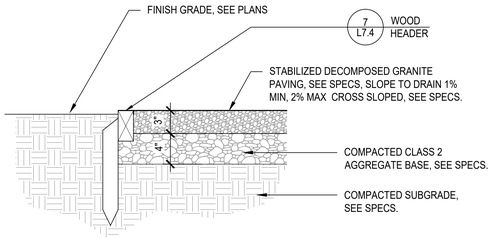

TOOLED SCORE / CONTROL JOINT

NOTES:
1. PROVIDE EJ'S AT ALL WALLS, COLUMNS AND SIMILAR VERTICAL STRUCTURES.
2. EXPANSION JOINTS AS SHOWN ON PLAN.
3. DOWEL IS TYPICAL AT ALL EJ'S EXCEPT AGAINST CURBS, WALLS, COLUMNS OR SIMILAR VERTICAL STRUCTURES, UNLESS OTHERWISE NOTED ON THE DRAWING.

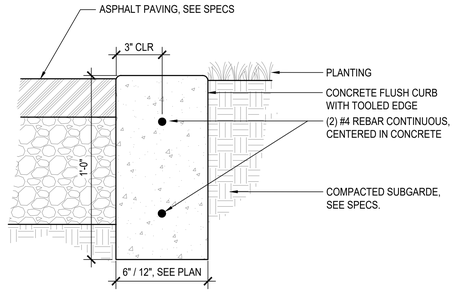
## 4 EXPANSION AND CONTROL JOINTS
SCALE: 3" = 1'-0"



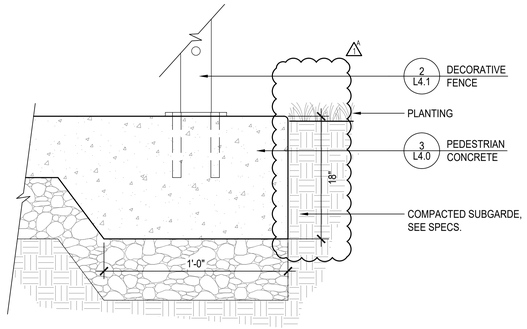

## 1 ASPHALT PAVING (PEDESTRIAN)
SCALE: 1-1/2" = 1'-0"



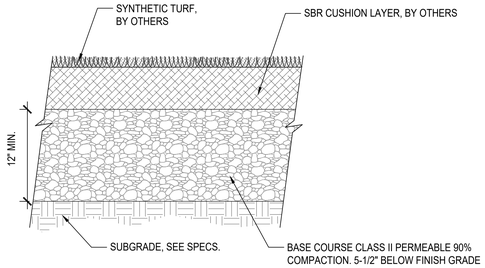

## 7 STABILIZED DECOMPOSED GRANITE
SCALE: 1-1/2" = 1'-0"




## 2 6" / 12" WIDE CONCRETE FLUSH CURB
SCALE: 3" = 1'-0"

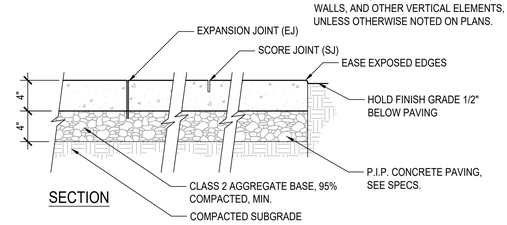



## 8 CONCRETE EDGE AT DECORATIVE FENCE
NTS



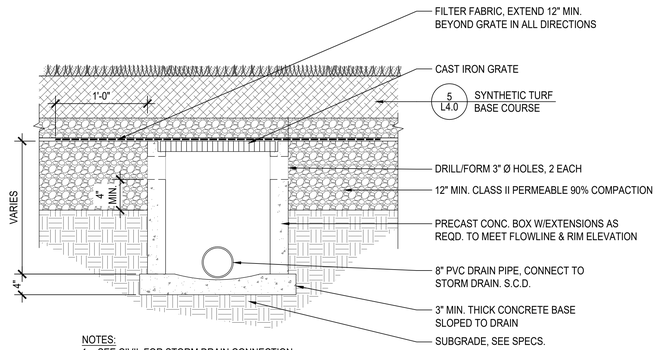

## 5 SYNTHETIC TURF BASE COURSE
SCALE: 1-1/2"=1'-0"

NOTES:
1. MEDIUM BROOM FINISH, UNLESS OTHERWISE NOTED ON PLANS.
2. PROVIDE SCORE JOINTS (SJ) AND EXPANSION JOINTS (EJ) AS SHOWN ON PLAN.
3. PROVIDE (EJ) MAX. 18' O.C. BOTH DIRECTIONS, ADJACENT TO BUILDINGS, WALLS, AND OTHER VERTICAL ELEMENTS, UNLESS OTHERWISE NOTED ON PLANS.




SECTION

## 3 PEDESTRIAN CONCRETE
SCALE: 1-1/2" = 1'-0"




NOTES:
1. SEE CIVIL FOR STORM DRAIN CONNECTION.
2. SEE CIVIL RIM ELEVATIONS
3. AGGREGATE SUB-BASE TO BE SLOPED TO STORM DRAIN FOR POSITIVE DRAINAGE UNDER SAFETY SURFACING.

## 9 CATCH BASIN BELOW SAFETY SURFACING
NOT TO SCALE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**WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA**

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

LICENSED LANDSCAPE ARCHITECT
Licensed Landscape Architect
Signature
04/26/19
Renewal Date
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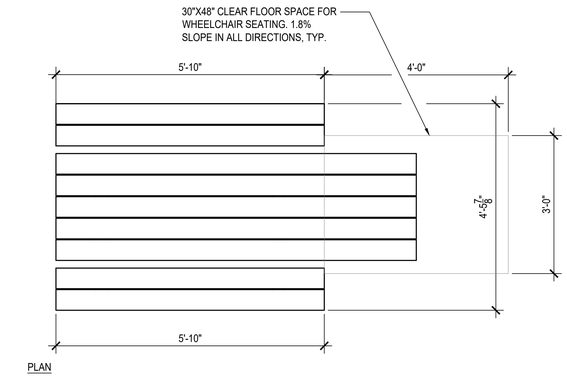
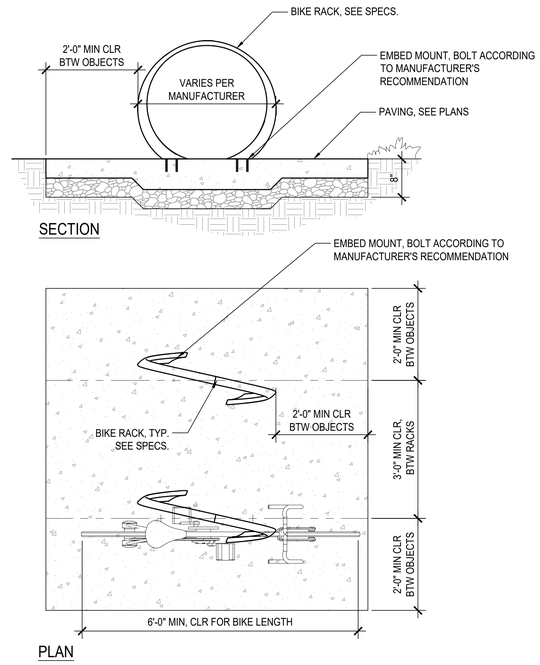
SHEET TITLE AND NO.
**CONSTRUCTION DETAILS**

**L4.0**



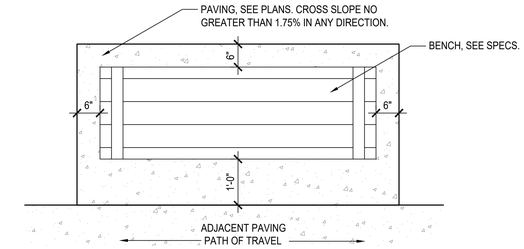

## 7 ACCESSIBLE PICNIC TABLE

SCALE: 3/4" = 1'-0"



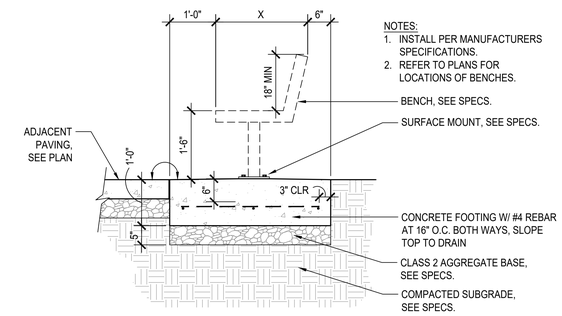

## 5 BIKE RACK - CIRCULAR

SCALE: 3/4" = 1'-0"




## 1 BENCH - PLAN

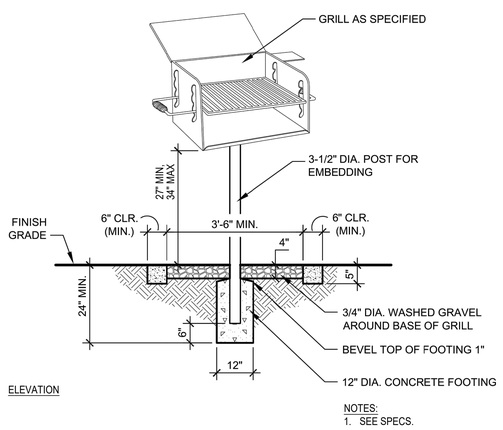
SCALE: 3/4" = 1'-0"




NOTES:
1. INSTALL PER MANUFACTURERS SPECIFICATIONS.
2. REFER TO PLANS FOR LOCATIONS OF BENCHES.

## 2 BENCH - SURFACE MOUNT

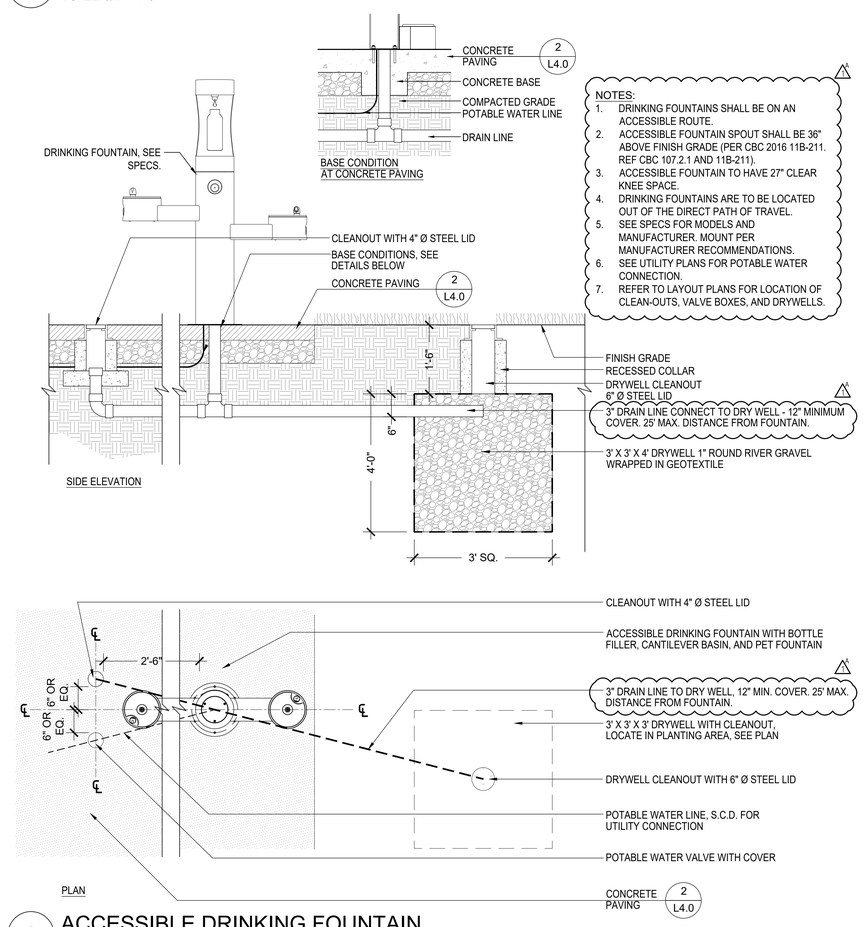
SCALE: 3/4" = 1'-0"




NOTES:
1. SEE SPECS.

## 8 PARK GRILL

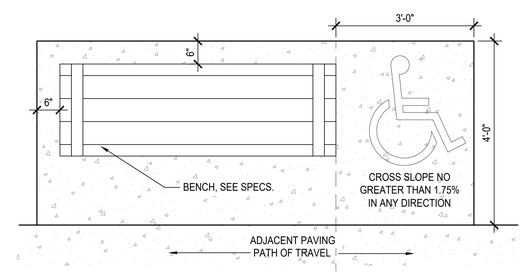
NTS




NOTES:
1. DRINKING FOUNTAINS SHALL BE ON AN ACCESSIBLE ROUTE.
2. ACCESSIBLE FOUNTAIN SPOUT SHALL BE 36" ABOVE FINISH GRADE (PER CBC 2016 11B-211. REF CBC 107.2.1 AND 11B-211).
3. ACCESSIBLE FOUNTAIN TO HAVE 27" CLEAR KNEE SPACE.
4. DRINKING FOUNTAINS ARE TO BE LOCATED OUT OF THE DIRECT PATH OF TRAVEL.
5. SEE SPECS FOR MODELS AND MANUFACTURER. MOUNT PER MANUFACTURER RECOMMENDATIONS.
6. SEE UTILITY PLANS FOR POTABLE WATER CONNECTION.
7. REFER TO LAYOUT PLANS FOR LOCATION OF CLEAN-OUTS, VALVE BOXES, AND DRYWELLS.

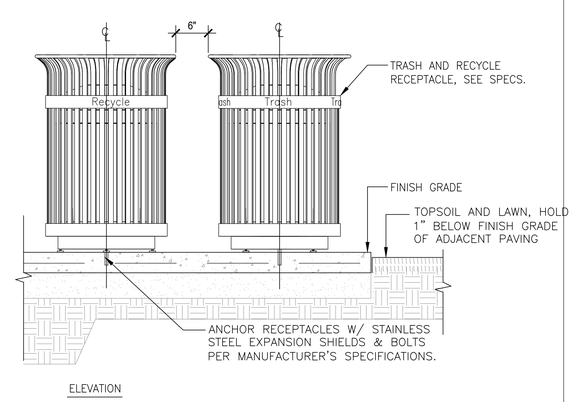
## 6 ACCESSIBLE DRINKING FOUNTAIN

SCALE: 3/4" = 1'-0"




## 3 BENCH WITH ADA COMPANION SEATING

SCALE: 3/4" = 1'-0"




## 4 TRASH AND RECYCLE RECEPTACLE

SCALE: 1" = 1'-0"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THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

# WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

LICENSED LANDSCAPE ARCHITECT
Signature
04/08/19
Renewal Date
03/05/19
Date
STATE OF CALIFORNIA

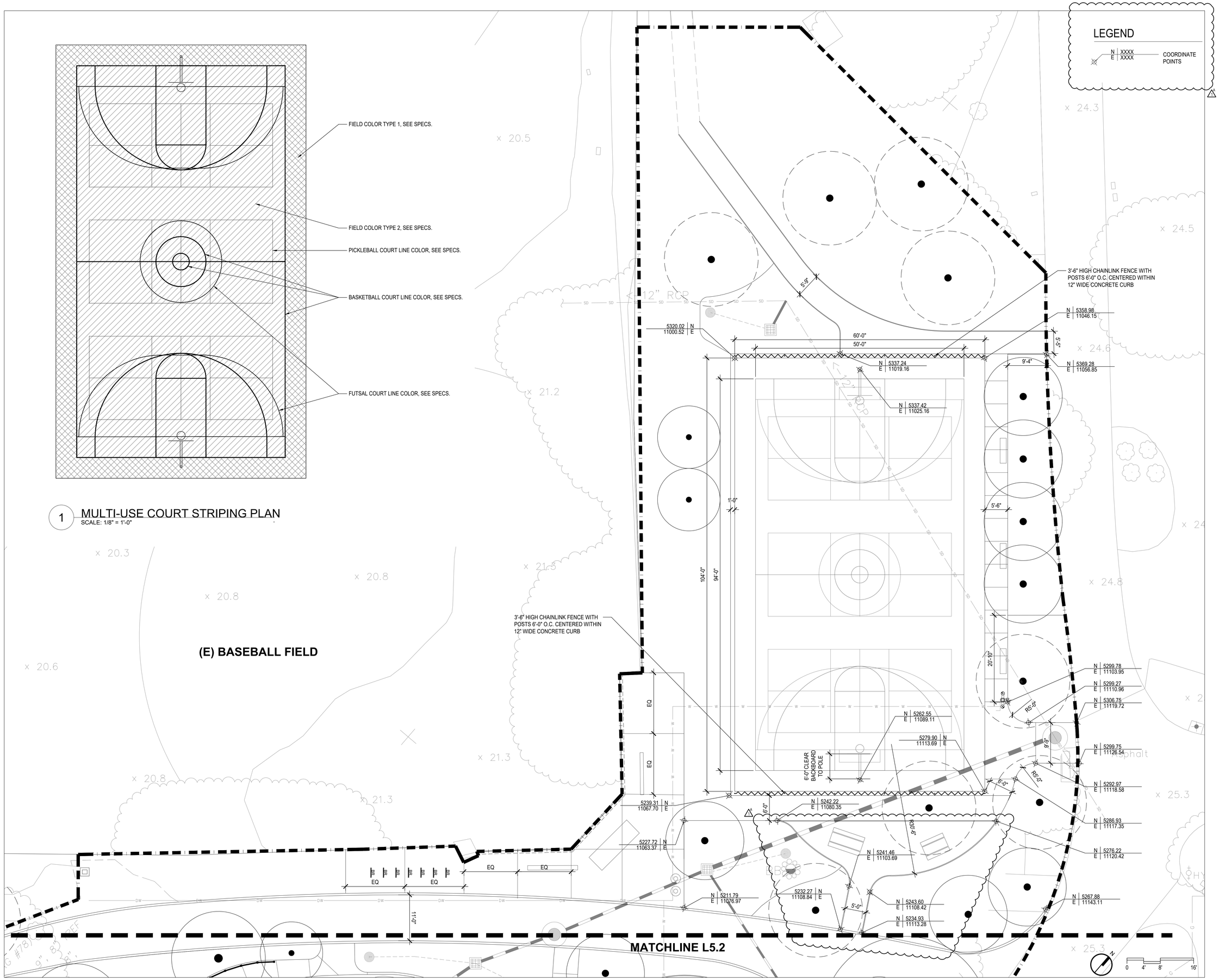
| | |
|---|---|
| Project Arch. | ---- |
| CA REG. | ---- |
| PROJECT: | 12421-04 |

| ISSUE | DATE |
|---|---|
| SCHEMATIC DESIGN | 11/02/18 |
| BID SET | 3/25/19 |
| 1 ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.
**CONSTRUCTION DETAILS**

**L4.2**

1 MULTI-USE COURT STRIPING PLAN
SCALE: 1/8" = 1'-0"

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**BURLINGAME**
**CA 94010**

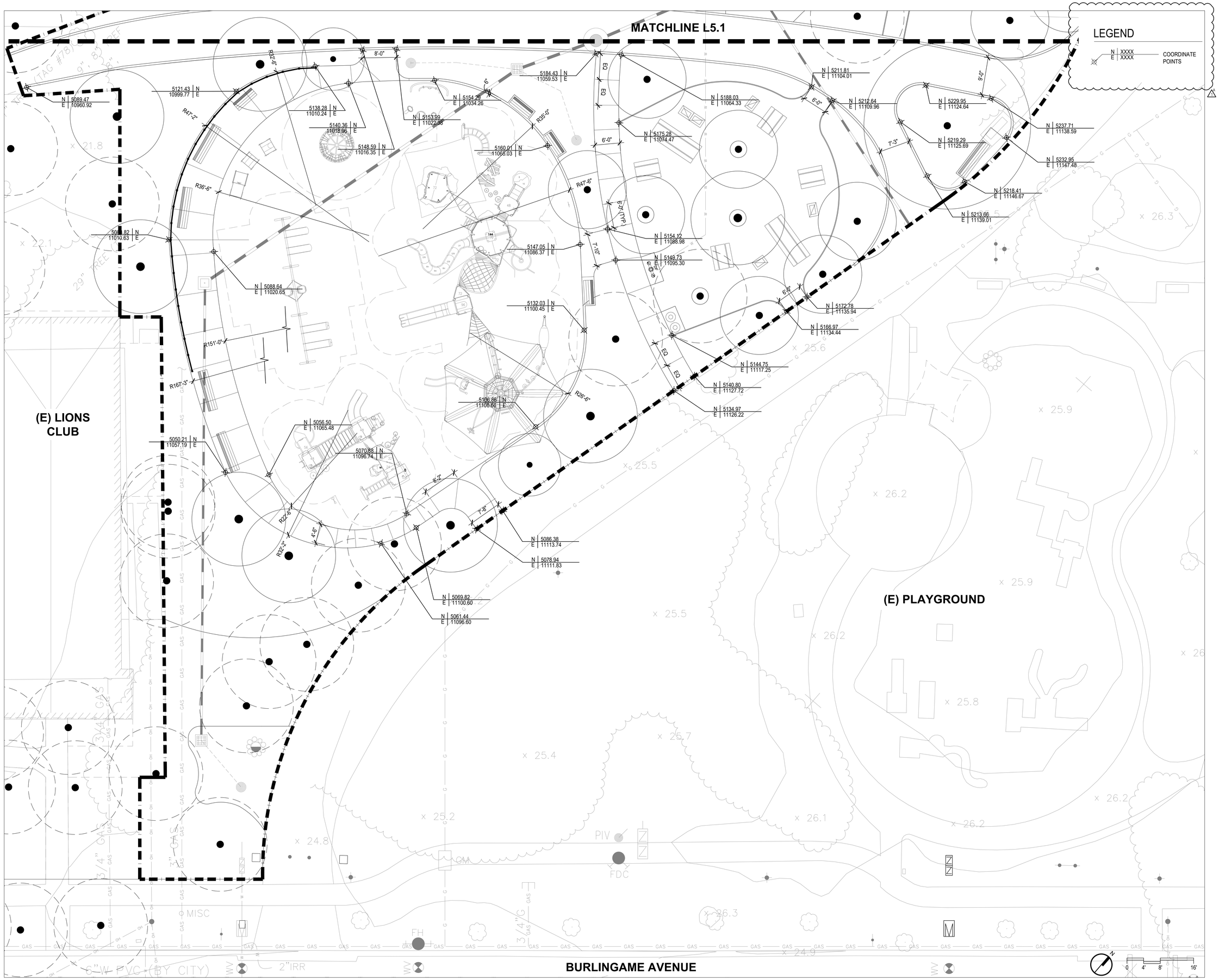
LICENSED LANDSCAPE ARCHITECT
Matthew Lindeman
Signature
04/30/19
Matthew Lindeman
03/28/19
Date
STATE OF CALIFORNIA

| | |
|---|---|
| Project Arch. | ---- |
| CA REG. | ---- |
| PROJECT: | 12421-04 |

| ISSUE | DATE |
|---|---|
| SCHEMATIC DESIGN | 11/02/18 |
| BID SET | 3/25/19 |
| ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.
**LAYOUT PLAN**

**L5.1**

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THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

# WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

LICENSED LANDSCAPE ARCHITECT
Matthew Lindsay Hall
Signature
04/08/19
Renewal Date
04/09/19
STATE OF CALIFORNIA

| | |
|---|---|
| Project Arch. | ---- |
| CA REG. | ---- |
| PROJECT: | 12421-04 |

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|---|---|
| SCHEMATIC DESIGN | 11/02/18 |
| BID SET | 3/25/19 |
| 1 ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.
**LAYOUT PLAN**

**L5.2**

## IRRIGATION NOTES

1. THESE IRRIGATION DRAWINGS ARE DIAGRAMMATIC AND INDICATIVE OF THE WORK TO BE INSTALLED. ALL PIPING, VALVES, AND OTHER IRRIGATION COMPONENTS MAY BE SHOWN WITHIN PAVED AREAS FOR GRAPHIC CLARITY ONLY AND ARE TO BE INSTALLED WITHIN PLANTING AREAS. DUE TO THE SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, SLEEVES, CONDUIT, AND OTHER ITEMS WHICH MAY BE REQUIRED. INVESTIGATE THE STRUCTURAL AND FINISHED CONDITION AFFECTING THE CONTRACT WORK INCLUDING OBSTRUCTIONS, GRADE DIFFERENCES OR AREA DIMENSIONAL DIFFERENCES. IN THE EVENT OF FIELD DISCREPANCY WITH CONTRACT DOCUMENTS, PLAN THE INSTALLATION WORK ACCORDINGLY BY NOTIFICATION AND APPROVAL OF THE OWNER'S AUTHORIZED REPRESENTATIVE AND ACCORDING TO THE CONTRACT SPECIFICATIONS. NOTIFY AND COORDINATE IRRIGATION CONTRACT WORK WITH APPLICABLE CONTRACTORS FOR THE LOCATION AND INSTALLATION OF PIPE, CONDUIT OR SLEEVES THROUGH OR UNDER WALLS, ROADWAYS, PAVING AND STRUCTURES BEFORE CONSTRUCTION. IN THE EVENT THESE NOTIFICATIONS ARE NOT PERFORMED, THE CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR REQUIRED REVISIONS.

2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, STANDARDS, AND REGULATIONS. ALL WORK AND MATERIALS SHALL BE IN FULL ACCORDANCE WITH THE LATEST RULES AND REGULATIONS OF THE NATIONAL ELECTRIC CODE; THE UNIFORM PLUMBING CODE, PUBLISHED BY THE WESTERN PLUMBING OFFICIALS ASSOCIATION; AND OTHER STATE OR LOCAL LAWS OR REGULATIONS. NOTHING IN THESE DRAWINGS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES OR REGULATIONS. THE CONTRACTOR SHALL FURNISH WITHOUT ANY EXTRA CHARGE, ANY ADDITIONAL MATERIAL AND LABOR WHEN REQUIRED BY THE COMPLIANCE WITH THESE CODES AND REGULATIONS.

3. THE CONTRACTOR SHALL COORDINATE INSTALLATION OF IRRIGATION SYSTEM WITH LAYOUT AND INSTALLATION OF THE PLANT MATERIALS TO INSURE THAT THERE WILL BE COMPLETE AND UNIFORM IRRIGATION COVERAGE OF PLANTING IN ACCORDANCE WITH THESE DRAWINGS, AND CONTRACT DOCUMENTS. THE IRRIGATION LAYOUT SHALL BE CHECKED BY THE CONTRACTOR AND OWNER'S AUTHORIZED REPRESENTATIVE PRIOR TO CONSTRUCTION TO DETERMINE IF ANY CHANGES, DELETIONS, OR ADDITIONS ARE REQUIRED. IRRIGATION SYSTEM SHALL BE INSTALLED AND TESTED PRIOR TO INSTALLATION OF PLANT MATERIAL.

4. THE INTENT OF THIS IRRIGATION SYSTEM IS TO PROVIDE THE MINIMUM AMOUNT OF WATER REQUIRED TO SUSTAIN GOOD PLANT HEALTH.

5. IT IS THE RESPONSIBILITY OF THE MAINTENANCE CONTRACTOR AND/OR OWNER TO PROGRAM THE IRRIGATION CONTROLLER(S) TO PROVIDE THE MINIMUM AMOUNT OF WATER NEEDED TO SUSTAIN GOOD PLANT HEALTH. THIS INCLUDES MAKING ADJUSTMENTS TO THE PROGRAM FOR SEASONAL WEATHER CHANGES, PLANT MATERIAL, WATER REQUIREMENTS, MOUNDS, SLOPES, SUN, SHADE AND WIND EXPOSURE.

6. IT IS THE RESPONSIBILITY OF A LICENSED ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT A.C. (2.5 AMP DEMAND PER CONTROLLER) ELECTRICAL SERVICE TO THE CONTROLLER LOCATION(S). IT IS THE RESPONSIBILITY OF THE IRRIGATION CONTRACTOR TO COORDINATE THE ELECTRICAL SERVICE STUB-OUT TO THE CONTROLLER(S). PROVIDE PROPER GROUNDING PER CONTROLLER MANUFACTURER'S INSTRUCTIONS AND IN ACCORDANCE WITH LOCAL CODES.

7. PROVIDE EACH CONTROLLER WITH ITS OWN GROUND ROD. SEPARATE THE GROUND RODS BY A MINIMUM OF EIGHT FEET. THE GROUND ROD SHALL BE AN EIGHT FOOT LONG BY 5/8" DIAMETER U.L. APPROVED COPPER CLAD ROD. INSTALL NO MORE THAN 6" OF THE GROUND ROD ABOVE FINISH GRADE. CONNECT #6 GAUGE WIRE WITH A U.L. APPROVED GROUND ROD CLAMP TO ROD AND BACK TO GROUND SCREW AT BASE OF CONTROLLER WITH APPROPRIATE CONNECTOR. MAKE THIS WIRE AS SHORT AS POSSIBLE, AVOIDING KINKS OR BENDING.

8. INSTALL NEW BATTERIES IN THE IRRIGATION CONTROLLER(S) TO RETAIN PROGRAM IN MEMORY DURING TEMPORARY POWER FAILURES. USE QUANTITY, TYPE AND SIZE REQUIRED AS PER CONTROLLER MANUFACTURER'S INSTRUCTIONS.

9. SCHEDULE A MEETING WHICH INCLUDES REPRESENTATIVES OF THE IRRIGATION CONTROLLER MANUFACTURER, THE MAINTENANCE CONTRACTOR, THE OWNER AND THE IRRIGATION CONTRACTOR AT THE SITE FOR INSTRUCTION ON THE PROPER PROGRAMMING AND OPERATION OF THE IRRIGATION CONTROLLER.

10. INSTALL 3" DETECTABLE TAPE ABOVE ALL PRESSURIZED MAIN LINES AS DETAILED. USE CHRISTY MODEL #TA-DT-3-BIRR FOR POTABLE IRRIGATION SYSTEMS OR #TA-DT-3-PRW FOR RECYCLED IRRIGATION WATER SYSTEMS.

11. PROVIDE EACH IRRIGATION CONTROLLER WITH ITS OWN INDEPENDENT LOW VOLTAGE COMMON GROUND WIRE.

12. IRRIGATION CONTROL WIRES: SOLID COPPER WITH U.L. APPROVAL FOR DIRECT BURIAL IN GROUND. COMMON GROUND WIRE: SIZE #12-1 WIRE WITH A WHITE INSULATING JACKET. CONTROL WIRE SERVICING REMOTE CONTROL VALVES: SIZE #14-1 WIRE WITH INSULATING JACKET OF COLOR OTHER THAN WHITE. SPLICES SHALL BE MADE WITH 3M-DBY SEAL PACKS OR APPROVED EQUAL.

13. INSTALL TWO SPARE CONTROL WIRES OF A DIFFERENT COLOR ALONG THE ENTIRE MAIN LINE. LOOP 36" EXCESS WIRE INTO EACH SINGLE VALVE BOX AND INTO ONE VALVE BOX IN EACH GROUP OF VALVES.

14. SPLICING OF LOW VOLTAGE WIRES IS PERMITTED IN VALVE BOXES ONLY. LEAVE A 36" LONG, 1" DIAMETER COIL OF EXCESS WIRE AT EACH SPLICE AND A 36" LONG EXPANSION LOOP EVERY 100 FEET ALONG WIRE RUN. TAPE WIRES TOGETHER EVERY TEN FEET. DO NOT TAPE WIRES TOGETHER WHERE CONTAINED WITHIN SLEEVING OR CONDUIT.

15. INSTALL GREEN PLASTIC VALVE BOXES WITH BOLT DOWN, NON HINGED COVER MARKED "IRRIGATION". BOX BODY SHALL HAVE KNOCK OUTS. ACCEPTABLE VALVE BOX MANUFACTURER'S INCLUDE NDS, CARSON OR APPROVED EQUAL.

15. INSTALL REMOTE CONTROL VALVE BOXES 12" FROM WALK, CURB, BUILDING OR LANDSCAPE FEATURE. AT MULTIPLE VALVE BOX GROUPS, INSTALL EACH BOX AN EQUAL DISTANCE FROM THE WALK, CURB, BUILDING OR LANDSCAPE FEATURE AND PROVIDE 12" BETWEEN BOX TOPS. ALIGN THE SHORT SIDE OF RECTANGULAR VALVE BOXES PARALLEL TO WALK, CURB, BUILDING OR LANDSCAPE FEATURE.

16. VALVE LOCATIONS SHOWN ARE DIAGRAMMATIC. INSTALL IN GROUND COVER/SHRUB AREAS (AVOID LAWN AREAS WHERE POSSIBLE).

17. THE CONTRACTOR SHALL LABEL CONTROL LINE WIRE AT EACH REMOTE CONTROL VALVE WITH A 2 1/4" X 2 3/4" POLYURETHANE I.D. TAG, INDICATING IDENTIFICATION NUMBER OF VALVE (CONTROLLER AND STATION NUMBER). ATTACH LABEL TO CONTROL WIRE. THE CONTRACTOR SHALL PERMANENTLY STAMP ALL VALVE BOX LIDS WITH APPROPRIATE IDENTIFICATION AS NOTED IN CONSTRUCTION DETAILS.

18. THE REMOTE CONTROL VALVES SPECIFIED ON THE DRAWINGS IS A PRESSURE REDUCING TYPE. SET THE DISCHARGE PRESSURE AS FOLLOWS:

A. SPRAY HEADS = 40 PSI
B. ROTARY HEADS = 60 PSI
C. DRIP EMITTERS = 35 PSI
D. BUBBLERS = 30 PSI

19. INSTALL A GATE VALVE TO ISOLATE EACH REMOTE CONTROL VALVE OR GROUP OF RCV'S LOCATED TOGETHER. GATE VALVE SIZE SHALL BE SAME AS THE LARGEST REMOTE CONTROL VALVE IN MANIFOLD.

20. FOR 2 1/2" AND LARGER MAIN LINE PIPING INSIDE SLEEVES USE 1120-315 PSI PVC PLASTIC PIPE WITH SCHEDULE 40 PVC COUPLINGS. DO NOT INSTALL GASKETED COUPLINGS INSIDE SLEEVES

21. FLUSH AND ADJUST IRRIGATION OUTLETS AND NOZZLES FOR OPTIMUM PERFORMANCE AND TO PREVENT OVER SPRAY ONTO WALKS, ROADWAYS, AND/OR BUILDINGS. SELECT THE BEST DEGREE OF THE ARC AND RADIUS TO FIT THE EXISTING SITE CONDITIONS AND THROTTLE THE FLOW CONTROL AT EACH VALVE TO OBTAIN THE OPTIMUM OPERATING PRESSURE FOR EACH CONTROL ZONE.

22. SET SPRINKLER HEADS PERPENDICULAR TO FINISH GRADE.

23. INSTALL NON POP-UP ROTARY SPRINKLERS 24" FROM WALKS AND CURBS.

24. INSTALL ROTARY POP-UP SPRINKLERS IN SHRUB AND GROUND COVER AREAS WITHIN A CONCRETE SPRINKLER BLOCK, CHRISTY "TYPE C"-20" SQUARE W/8" HOLE, 4" THICK AT HOLE AND 3" THICK AT EDGE OF BLOCK.

25. LOCATE BUBBLERS ON UPHILL SIDE OF PLANT OR TREE.

26. INSTALL A HUNTER HCV SERIES, KBI CV SERIES, OR APPROVED EQUAL SPRING LOADED CHECK VALVE IN SPRINKLER RISER ASSEMBLIES WHERE LOW OUTLET DRAINAGE WILL CAUSE EROSION AND/OR EXCESS WATER.

27. WHERE IT IS NECESSARY TO EXCAVATE ADJACENT TO EXISTING TREES, USE CAUTION TO AVOID INJURY TO TREES AND TREE ROOTS. EXCAVATE BY HAND IN AREAS WHERE TWO (2) INCH AND LARGER ROOTS OCCUR. BACK FILL TRENCHES ADJACENT TO TREE WITHIN TWENTY-FOUR (24) HOURS. WHERE THIS IS NOT POSSIBLE, SHADE THE SIDE OF THE TRENCH ADJACENT TO THE TREE WITH WET BURLAP OR CANVAS.

28. NOTIFY LOCAL JURISDICTIONS FOR INSPECTION AND TESTING OF INSTALLED BACKFLOW PREVENTION DEVICE.

29. THE IRRIGATION SYSTEM DESIGN IS BASED ON THE MINIMUM OPERATING PRESSURE SHOWN ON THE IRRIGATION DRAWINGS. VERIFY WATER PRESSURE PRIOR TO CONSTRUCTION. REPORT ANY DIFFERENCE BETWEEN THE WATER PRESSURE INDICATED ON THE DRAWINGS AND THE ACTUAL PRESSURE READING AT THE IRRIGATION POINT OF CONNECTION TO THE OWNER'S AUTHORIZED REPRESENTATIVE.

30. IRRIGATION DEMAND: REFER TO PLANS.

31. THE EXISTING MAIN LINE SHOWN ON THE DRAWINGS IS DIAGRAMMATIC. VERIFY AND LOCATE EXISTING MAIN LINE IN FIELD. REPORT TO ARCHITECT IN WRITING ANY DEVIATION OF EXISTING MAIN LINE LOCATION FROM THAT SHOWN ON THE DRAWINGS.

32. AT POINTS OF CONNECTION BETWEEN EXISTING MAIN LINE AND A NEW MAIN LINE BRANCH, USE THE FOLLOWING PROCEDURE:

A. REMOVE A PORTION OF EXISTING MAINLINE
B. FABRICATE A TEE AND NIPPLE ASSEMBLY REQUIRED FOR CONNECTION OF NEW MAIN LINE BETWEEN REMOVED PORTION OF EXISTING MAIN LINE. REFER TO SPECIFICATIONS FOR TYPE OF FITTINGS AND PIPE REQUIRED.

33. PIPE SIZING SHOWN ON THE DRAWINGS IS TYPICAL. AS CHANGES IN LAYOUT OCCUR DURING STAKING AND CONSTRUCTION THE SIZE MAY NEED TO BE ADJUSTED ACCORDINGLY.

34. PIPE THREAD SEALANT COMPOUND SHALL BE RECTOR SEAL #5.

35. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MINOR CHANGES IN THE IRRIGATION LAYOUT DUE TO OBSTRUCTIONS NOT SHOWN ON THE IRRIGATION DRAWINGS SUCH AS LIGHTS, FIRE HYDRANTS, SIGNS, ELECTRICAL ENCLOSURES, ETC.

36. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR CHANGES IN THE IRRIGATION LAYOUT AND VALVE ZONING DUE TO VARIATIONS IN THE EXISTING SITE CONDITIONS SUCH AS EXPOSURE FROM BUILDINGS, TRELLISES, TREES, ETC., AS WELL AS SLOPE AND SOIL CONDITIONS. THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT AND IRRIGATION CONSULTANT OF THE PROPOSED CHANGES PRIOR TO INSTALLATION FOR APPROVAL.

37. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR ADJUSTING THE IRRIGATION SYSTEM DESIGN IF THE PLANTING DESIGN CHANGES FROM THE ORIGINAL PLAN AND NEEDS TO ADAPT TO THE NEW PLANTING DESIGN. THE LANDSCAPE CONTRACTOR NEEDS TO NOTIFY THE LANDSCAPE ARCHITECT AND IRRIGATION CONSULTANT OF PROPOSED CHANGES PRIOR TO INSTALLATION FOR APPROVAL.

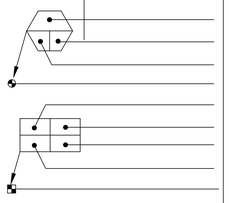
38. WHEN WORK OF THIS SECTION HAS BEEN COMPLETED AND SUCH OTHER TIMES AS MAY BE DIRECTED, REMOVE ALL TRASH, DEBRIS, SURPLUS MATERIALS AND EQUIPMENT FROM SITE.

39. CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLEMENTAL HAND WATERING OF ALL PLANT MATERIAL WITHIN DRIPLINE AREAS UNTIL THE PLANTS ARE SUFFICIENTLY ESTABLISHED.

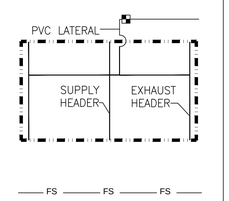
40. VERIFY LOCATIONS OF ALL IRRIGATION COMPONENTS INSTALLED WITHIN A VALVE BOX WITH LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. DO NOT INSTALL UNTIL LANDSCAPE ARCHITECT PROVIDES ACCEPTABLE LOCATIONS.

## IRRIGATION LEGEND

| SYMBOL | MODEL NUMBER | DESCRIPTION | NOZZLE GPM | OPERATING PSI | OPERATING RADIUS (FEET) |
|---|---|---|---|---|---|
| | I-20-06-SS-3.0SR | HUNTER POP-UP GEAR DRIVEN ROTOR (TURF) | 3.0 | 50 | 20-25 |
| | I-20-06-SS-1.5SR | HUNTER POP-UP GEAR DRIVEN ROTOR (TURF) | 1.5 | 50 | 20-25 |
| | I-20-06-SS-2.0SR | HUNTER POP-UP GEAR DRIVEN ROTOR (TURF) | 2.0 | 50 | 16-18 |
| | I-20-06-SS-2.0SR | HUNTER POP-UP GEAR DRIVEN ROTOR (TURF) | 2.0 | 50 | 16-18 |
| | I-20-06-SS-1.0SR | HUNTER POP-UP GEAR DRIVEN ROTOR (TURF) | 1.0 | 50 | 16-18 |
| | 570Z-6P-PRX-COM/ O-T-15FP,15HP,15QP | TORO POP-UP SPRAY SPRINKLER (TURF) | 2.3,1.2,0.6 | 30 | 12-15 |
| | 570Z-6P-PRX-COM/ O-T-12FP,12HP,12QP | TORO POP-UP SPRAY SPRINKLER (TURF) | 1.5,0.75,.37 | 30 | 10-12 |
| | 570Z-06P-PRX-COM/ O-T-10HP,10QP | TORO POP-UP SPRAY SPRINKLER (TURF) | 0.5,0.23 | 30 | 8-10 |
| | 570Z-06P-PRX-COM/ O-T-8HP,8QP | TORO POP-UP SPRAY SPRINKLER (TURF) | .33,.17 | 30 | 6-8 |
| | 570Z-12P-PRX-COM/ O-T-15HP,15QP | TORO POP-UP SPRAY SPRINKLER (SHRUB) | 1.2,0.6 | 30 | 12-15 |
| | 570Z-12P-PRX-COM/ O-T-12FP,12HP,12QP | TORO POP-UP SPRAY SPRINKLER (SHRUB) | 1.5,0.75,.37 | 30 | 10-12 |
| | 570Z-12P-PRX-COM/ O-T-10FP,10HP,10QP | TORO POP-UP SPRAY SPRINKLER (SHRUB) | 1,0.5,0.23 | 30 | 8-10 |
| | 570Z-12P-PRX-COM/ O-T-8HP,8QP | TORO POP-UP SPRAY SPRINKLER (SHRUB) | .33,.17 | 30 | 6-8 |
| | PCB-25 | HUNTER BUBBLER (TREE) 2 PER TREE | 0.5 | 30 | TRICKLE |
| | PROS-04/ PCN-10 | HUNTER POP-UP STREAM BUBBLER (TREES IN DG), 2 PER TREE | 0.46 | 30 | STREAM |
| | PLD-BV | HUNTER MANUAL FLUSH VALVE | | | |
| | PLD-AVR | HUNTER AIR/VACUUM RELIEF VALVE | | | |
| | PROS-06-SI/4A | HUNTER POP-UP SPRINKLER WITH SIDE INLET AND A CLOSED 4" NOZZLE TO BE USED AS DRIPLINE INDICATOR | | | |
| | ICV SERIES | HUNTER REMOTE CONTROL VALVE | | | |
| | ICV-101G-AS-40/ HY-100 | HUNTER REMOTE CONTROL VALVE WITH A 40 PSI PRESSURE REGULATOR AND A 1" FILTER. | | | |
| | 33 DNP | RAIN BIRD QUICK COUPLING VALVE | | | |
| | LGT-XX-SS | LEEMCO STAINLESS STEEL GATE VALVE (LINE SIZE) | | | |
| | 2160H | GRISWOLD 1" NORMALLY OPEN MASTER VALVE | | | |
| | FM-1B | Calsense FLOW SENSOR | | | |
| | 2000L | GRISWOLD 2" NORMALLY CLOSED MASTER VALVE | | | |
| | FM-2 | Calsense FLOW SENSOR | | | |
| | - | EXISTING 2" BACKFLOW PREVENTER. | | | |
| | CS3-48-SSE-PED/ | Calsense CS300 STATION CONVENTIONAL WIRE CONTROLLER IN A PEDESTAL ENCLOSURE | | | |




| | |
|---|---|
| MAIN LINE: | MAIN LINE: 3" AND LARGER: 1120-200 PSI RING-TITE PVC PLASTIC PIPE WITH DUCTILE IRON FITTINGS AND THRUST BLOCKS AT ALL CHANGES FOR DIRECTION. 24" COVER. |
| MAIN LINE: | 3" AND SMALLER: 1120-SCHEDULE 40 PVC PLASTIC PIPE WITH SCHEDULE 40 PVC SOLVENT WELD FITTINGS. 18" COVER. |
| LATERAL LINE: | 3/4" AND LARGER: 1120-SCHEDULE 40 PVC PLASTIC PIPE WITH SCHEDULE 40 PVC SOLVENT WELD FITTINGS. 12" COVER. |
| DRIPLINE LATERAL LINE: | 3/4" AND LARGER: 1120-SCHEDULE 40 PVC PLASTIC PIPE WITH SCHEDULE 40 PVC SOLVENT WELD FITTINGS. 12" COVER. |
| SLEEVING: | SCHEDULE 40 PVC PLASTIC PIPE. COVER TO BE AS INDICATED IN SPECIFICATIONS OR AS INDICATED ABOVE FOR PIPE DEPTH OF COVER. |
| | DRIPLINE REMOTE CONTROL VALVE |
| DRIP ZONE: | HUNTER HDL SERIES DRIPLINE WITH PLD LOC FITTINGS, PART #HDL-06-18-250. TUBING TO BE INSTALLED 4" BELOW GRADE IN A 18" O.C. GRID ACCORDING TO DETAILS. SIZE EXHAUST HEADERS AS FOLLOWS: 1": 0-10 GPM, 1.25": 11-20 GPM. ALL EXHAUST HEADERS SHALL BE 1" SCH 40 PVC OR 1" SCH 40 FLEXIBLE PVC. USE SCH. 40 PVC SOLVENT WELD FITTINGS. EXTEND PVC HEADERS TO THE ENDS OF ALL DRIP ZONES TO BALANCE FLOW IF REQUIRED. SEE DETAILS FOR FURTHER INFORMATION. |
| FLOW SENSOR/ MASTER CABLE: | APPROXIMATE ROUTING OF FLOW SENSOR AND MASTER VALVE WIRES IN SEPARATE 1" CONDUITS. REFER TO DETAILS FOR MORE INFORMATION. |





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THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

**WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA**

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

LICENSED LANDSCAPE ARCHITECT
Walter Lindner
Signature
04/30/19
Renewal Date
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SHEET TITLE AND NO.
**IRRIGATION NOTES & LEGEND**

**L6.0**

NOTES:

1. ONE BUBBLER SYMBOL IS SHOWN AT TREES FOR GRAPHIC CLARITY ONLY. INSTALL MINIMUM TWO BUBBLERS AT EACH TREE. INSTALL REQUIRED NUMBER OF BUBBLERS AS DETAILED.
2. IRRIGATION EQUIPMENT MAY BE SHOWN WITHIN HARDSCAPE FOR GRAPHIC CLARITY ONLY. INSTALL ALL IRRIGATION EQUIPMENT WITHIN PLANTED AREAS. IRRIGATION PIPE AND WIRE CROSSING BENEATH HARDSCAPE SURFACES SHALL BE CONTAINED WITHIN SLEEVING OR SCHEDULE 40 PVC CONDUIT. SLEEVING SIZE SHALL BE A MINIMUM OF TWO TIMES THE AGGREGATE DIAMETER OF ALL PIPES CONTAINED WITH SLEEVE. PROVIDE VERTICAL SWEEP FOR ALL ELECTRICAL CONDUIT ON EACH SIDE OF HARDSCAPE AND TERMINATE ENDS AT 12" MINIMUM DEPTH AND 12" FROM HARDSCAPE SURFACE.
3. UNSIZED LATERAL LINE PIPING LOCATED DOWN STREAM OF 1" PIPING SHALL BE 3/4" IN SIZE (TYPICAL).
4. SIZING OF LATERAL PIPE SHALL BE AS FOLLOWS:

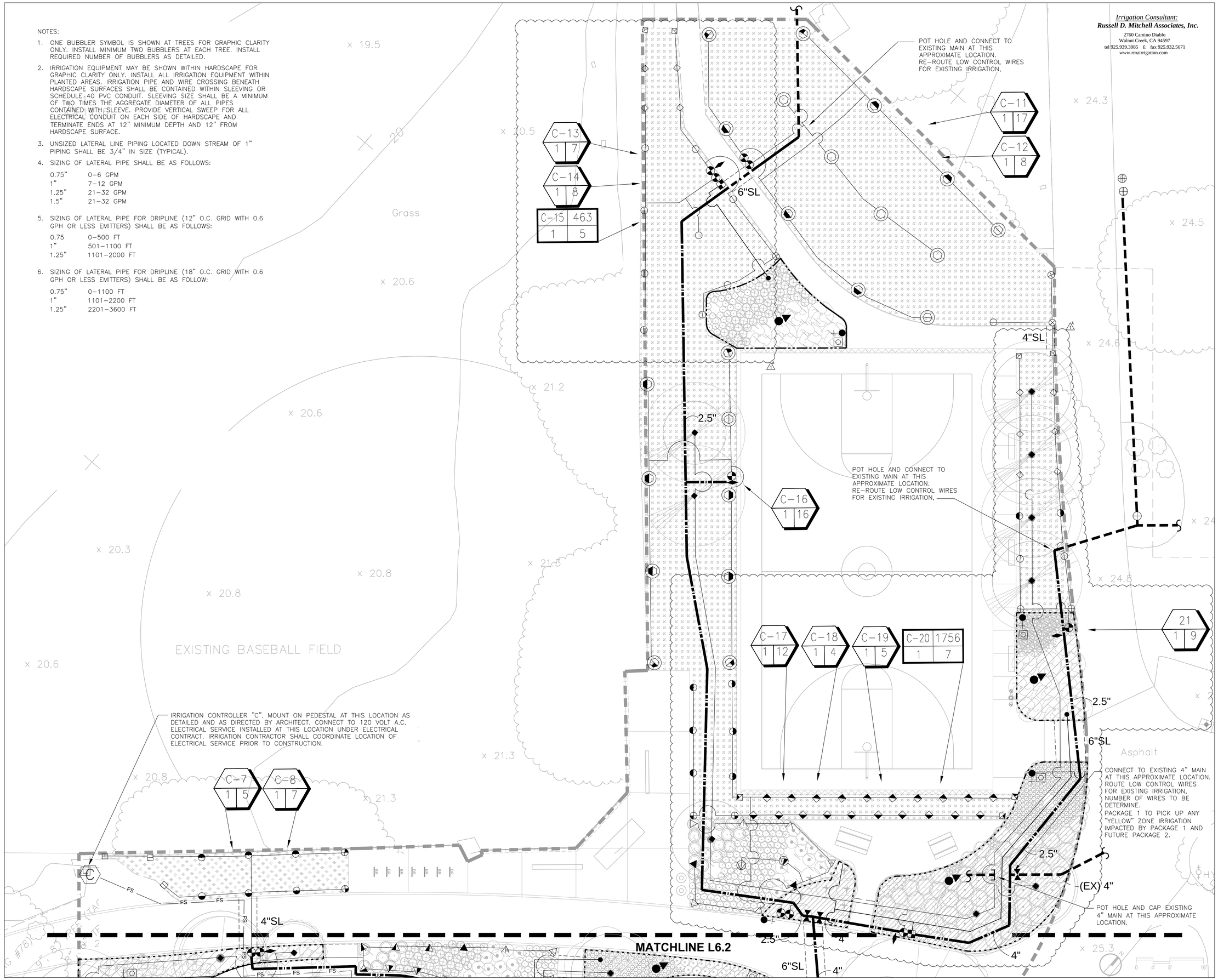
| | |
|---|---|
| 0.75" | 0–6 GPM |
| 1" | 7–12 GPM |
| 1.25" | 21–32 GPM |
| 1.5" | 21–32 GPM |

5. SIZING OF LATERAL PIPE FOR DRIPLINE (12" O.C. GRID WITH 0.6 GPH OR LESS EMITTERS) SHALL BE AS FOLLOWS:

| | |
|---|---|
| 0.75 | 0–500 FT |
| 1" | 501–1100 FT |
| 1.25" | 1101–2000 FT |

6. SIZING OF LATERAL PIPE FOR DRIPLINE (18" O.C. GRID WITH 0.6 GPH OR LESS EMITTERS) SHALL BE AS FOLLOW:

| | |
|---|---|
| 0.75" | 0–1100 FT |
| 1" | 1101–2200 FT |
| 1.25" | 2201–3600 FT |





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THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

# WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

LICENSED LANDSCAPE ARCHITECT
Christopher Lindgren
Signature
04/30/19
Renewal Date
03/25/19
Date
STATE OF CALIFORNIA

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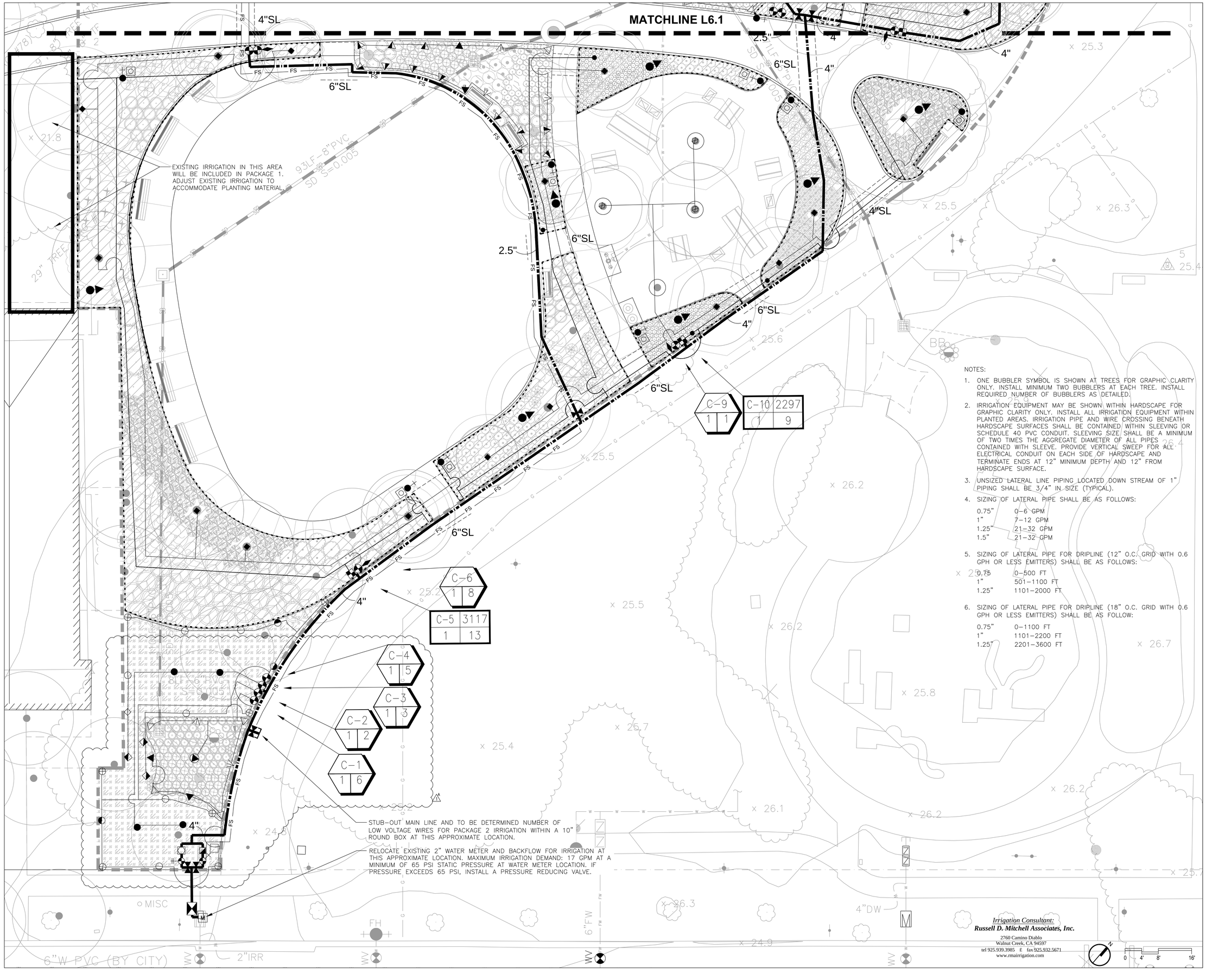
SHEET TITLE AND NO.
**IRRIGATION PLAN**

**L6.1**

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SHEET TITLE AND NO.
**IRRIGATION PLAN**

**L6.2**

IRRIGATION WATER USE CALCULATIONS

## WATER USE ESTIMATION & IRRIGATION SCHEDULE - BURLINGAME COMMUNITY CENTER, PACKAGE 1

| | | |
|---|---|---|
| WATER TYPE | POTABLE | |
| CITY | Burlingame | *Nearest City to project with published ET data* |
| ETO | 35.1 | |
| DATE | 4/17/2019 | |

REGULAR LANDSCAPE AREAS

| STATION/HYDROZONE | GPM | AREA (sq.ft) (HA) | WATER USE TYPE (LW=LOW, MW=MOD, HW=HIGH) | PLANT TYPE | IRRIGATION TYPE | PLANT FACTOR (PF) | IRRIGATION EFFICIENCY (IE) | PRECIP. RATE/ APPLICATION RATE (IN/HR) | ETAF (PF/IE) | CYCLES PER DAY | DAYS PER WEEK | JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEP | OCT | NOV | DEC | ETWU (GALLONS PER YEAR) | PERCENTAGE OF LANDSCAPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | MONTHLY ETO | | | | | | | | | | | | | |
| | | | | | | | | | | | | 1.5 | 1.3 | 2.4 | 3.0 | 3.7 | 4.6 | 4.9 | 4.8 | 4.1 | 2.8 | 1.3 | 0.7 | | |
| | | | | | | | | | | | | TOTAL RUN TIME IN MINUTES PER DAY | | | | | | | | | | | | | |
| C-1 | 6 | 400 | LW | BIOSWALE LW | SPRAY | 0.3 | 0.75 | 1 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 3,482 | 2% |
| C-2 | 2 | 96 | LW | GRASSES LW | SPRAY | 0.3 | 0.75 | 1 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 836 | 0% |
| C-3 | 3 | 378 | LW | GRASSES LW | SPRAY | 0.3 | 0.75 | 1 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 3,290 | 2% |
| C-4 | 6 | 1007 | LW | GRASSES LW | SPRAY | 0.3 | 0.75 | 1 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 8,766 | 5% |
| C-5 | 13 | 3117 | LW | SHRUB GC LW | DRIPLINE12" | 0.3 | 0.81 | 0.9 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 25,123 | 15% |
| C-6 | 8 | 700 | MW | TREE MW | BUBBLER | 0.5 | 0.81 | 0.85 | 0.6 | 2 | 3 | 0.0 | 0.0 | 8.0 | 10.0 | 13.0 | 16.0 | 17.0 | 16.0 | 14.0 | 10.0 | 5.0 | 0.0 | 9,403 | 3% |
| C-7 | 5 | 518 | LW | GRASSES LW | SPRAY | 0.3 | 0.75 | 1 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 4,509 | 3% |
| C-8 | 7 | 687 | MW | BIOSWALE MW | SPRAY | 0.5 | 0.75 | 1 | 0.7 | 2 | 3 | 0.0 | 0.0 | 8.0 | 10.0 | 12.0 | 14.0 | 15.0 | 15.0 | 13.0 | 9.0 | 4.0 | 0.0 | 9,967 | 3% |
| C-9 | 1 | 150 | MW | TREE MW | BUBBLER | 0.5 | 0.81 | 0.85 | 0.6 | 2 | 3 | 0.0 | 0.0 | 8.0 | 10.0 | 13.0 | 16.0 | 17.0 | 16.0 | 14.0 | 10.0 | 5.0 | 0.0 | 2,015 | 1% |
| C-10 | 9 | 2297 | LW | SHRUB GC LW | DRIPLINE12" | 0.3 | 0.81 | 0.9 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 18,514 | 11% |
| C-11 | 17 | 1440 | LW | GRASSES LW | SPRAY | 0.3 | 0.75 | 1 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 12,535 | 7% |
| C-12 | 8 | 1439 | LW | GRASSES LW | SPRAY | 0.3 | 0.75 | 1 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 12,526 | 7% |
| C-13 | 7 | 622 | LW | GRASSES LW | SPRAY | 0.3 | 0.75 | 1 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 5,414 | 3% |
| C-14 | 8 | 656 | LW | GRASSES LW | SPRAY | 0.3 | 0.75 | 1 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 5,710 | 3% |
| C-15 | 5 | 463 | MW | SHRUB GC MW | DRIPLINE12" | 0.5 | 0.81 | 0.9 | 0.6 | 2 | 3 | 0.0 | 0.0 | 8.0 | 10.0 | 12.0 | 15.0 | 16.0 | 15.0 | 13.0 | 9.0 | 5.0 | 0.0 | 6,220 | 2% |
| C-16 | 16 | 1690 | LW | GRASSES LW | SPRAY | 0.3 | 0.75 | 1 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 14,711 | 8% |
| C-17 | 12 | 786 | LW | GRASSES LW | SPRAY | 0.3 | 0.75 | 1 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 6,842 | 4% |
| C-18 | 4 | 591 | MW | BIOSWALE MW | BUBBLER | 0.5 | 0.81 | 0.85 | 0.6 | 2 | 3 | 0.0 | 0.0 | 8.0 | 10.0 | 13.0 | 16.0 | 17.0 | 16.0 | 14.0 | 10.0 | 5.0 | 0.0 | 7,939 | 3% |
| C-19 | 5 | 450 | MW | TREE MW | BUBBLER | 0.5 | 0.81 | 0.85 | 0.6 | 2 | 3 | 0.0 | 0.0 | 8.0 | 10.0 | 13.0 | 16.0 | 17.0 | 16.0 | 14.0 | 10.0 | 5.0 | 0.0 | 6,045 | 2% |
| C-20 | 7 | 1756 | LW | SHRUB GC LW | DRIPLINE12" | 0.3 | 0.81 | 0.9 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 14,153 | 9% |
| C-21 | 9 | 988 | LW | GRASSES LW | SPRAY | 0.3 | 0.75 | 1 | 0.4 | 2 | 2 | 0.0 | 0.0 | 7.0 | 9.0 | 11.0 | 13.0 | 14.0 | 14.0 | 12.0 | 8.0 | 4.0 | 0.0 | 8,600 | 5% |
| | TOTAL | 20,231 | | | | | | | | | | | | | | | | | | | | | TOTAL | 186,601 | 100% |

SPECIAL LANDSCAPE AREAS

| HYDROZONE # | HYDROZONE NAME | AREA (sq.ft) (HA) | Percentage of Landscape |
|---|---|---|---|
| | | | 0% |

*THE IRRIGATION VALVE SCHEDULE SHOWN ABOVE IS INTENDED TO BE USED AS A GUIDELINE ONLY AND INDICATES THE APPROXIMATE RUN TIMES IN MINUTES FOR EACH VALVE BASED ON ESTIMATED WEEKLY WATER REQUIREMENTS FOR ESTABLISHED PLANT MATERIAL. THE TIMES SHOWN ARE APPROXIMATE AND HAVE BEEN DEVELOPED FROM LOCAL AND CURRENT AVERAGES FOR EVAPOTRANSPIRATION, AND REFLECTTHE WATER REQUIREMENTS OF THE PLANT MATERIAL BASED ON PLANT TYPE AND THE APPROXIMATE PRECIPITATION OR APPLICATION RATES OF THE IRRIGATION SYSTEM TYPE. ACTUAL RUN TIMES MAY BE DIFFERENT DEPENDING ON A VARIETY OF FACTORS INCLUDING TOPOGRAPHY, SOIL STRUCTURE, SUN AND WIND EXPOSURE, WEATHER, ACTUAL PLANT WATER REQUIREMENTS, OVERALL PRECIPITATION RATE OF ZONE, ETC.*

| | | |
|---|---|---|
| MAWA | GALLONS/YR | 198,120 |
| | ACRE FEET/YR | 0.61 |
| | HCF/YR | 264.87 |
| ETWU | GALLONS/YR | 186,601 |
| | ACRE FEET/YR | 0.57 |
| | HCF/YR | 249.47 |

| SITE IRRIGATION EFFICIENCY | SITE PLANT FACTOR | MAWA COMPLIANT |
|---|---|---|
| 74.0% | 0.31 | YES |

**MAWA FORMULA**

MAXIMUM APPLIED WATER ALLOWANCE (MAWA) GALLONS PER YEAR

MAWA = (ETo)(0.62)[(LA x 0.45) + (0.55 x SLA)]

ETo = REFERENCE EVAPOTRANSPIRATION

0.45= ET ADJUSTMENT FACTOR

LA=LANDSCAPED AREA (SQUARE FEET)
0.62 = CONVERSION FACTOR (GALLONS/SQ.FT/YR)

**ETWU FORMULA**

ESTIMATED TOTAL WATER USE (ETWU) GALLONS PER YEAR

ETWU= ((ETO)(.62)(ETAF x LA))

ETo = REFERENCE EVAPOTRANSPIRATION

PF = PLANT FACTOR FOR HYDROZONES

HA = HYDROZONE AREA (SQ.FT)
0.62 = CONVERSION FACTOR (GALLONS/SQ.FT/YR)

IE = IRRIGATION EFFICIENCY (0.81)-BUBBLER/DRIP

IE = IRRIGATION EFFICIENCY (0.75)-ROTORS/SPRAY


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State of California
Signature
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Renewal Date
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SHEET TITLE AND NO.
**IRRIGATION WATER USE CALCULATIONS**

**L6.7**

## PLANT SCHEDULE

### TREES

| SYMBOL | QTY. | ABBR. | SCIENTIFIC NAME | COMMON NAME | SIZE | WATER USE | HEIGHT | SPREAD | CALIPER | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | ARB MAR | ARBUTUS 'MARINA' | STRAWBERRY TREE | 36" BOX | LOW | 25'-0" | 20'-0" | 1-3/4" TO 2-1/2" | STD |
| | 2 | ARC MAN | ARCTOSTAPHYLOS MANZANITA 'DR. HURD' | COMMON MANZANITA 'DR. HURD' | 24" BOX | LOW | 14'-0" | 13'-0" | 1" TO 1-3/4" | MULTI-TRUNK |
| | 1 | COR FLO | CORNUS FLORIDA | DOGWOOD | 36" BOX | MEDIUM | 20'-0" | 20'-0" | 1-3/4" TO 2-1/2" | STD |
| | 1 | DAV INV | DAVIDIA INVOLUCRATA | DOVE TREE | 36" BOX | MEDIUM | 30'-0" | 30'-0" | 1-3/4" TO 2-1/2" | STD |
| | 1 | FAG SYL | FAGUS SYLVATICA PURPUREA | COPPER BEECH | 60" BOX | MEDIUM | 60'-0" | 50'-0" | N/A | SPECIMEN REE, SEE NOTE 10 |
| | 2 | LAG IND | LAGERSTROEMIA INDICA 'TUSCARORA' | CRAPE MYRTLE 'TUSCARORA' | 24" BOX | MEDIUM | 15'-0" | 13'-0" | 1" TO 1-3/4" | STD |
| | 1 | MAG SOU | MAGNOLIA X SOULANGEANA | SAUCER MAGNOLIA | 36" BOX | MEDIUM | 20'-0" | 20'-0" | 1-3/4" TO 2-1/2" | STD |
| | 2 | MAL FLO | MALUS FLORIBUNDA | CRABAPPLE | 24" BOX | MEDIUM | 18'-0" | 20'-0" | 1" TO 1-3/4" | MULTI-TRUNK |
| | 5 | OLE EUR | OLEA EUROPAEA 'SWAN HILL' | OLIVE TREE 'SWAN HILL' | 36" BOX | LOW | 25'-0" | 25'-0" | 1-3/4" TO 2-1/2" | NON-FRUITING |
| | 6 | PIS CHI | PISTACIA CHINENSIS | CHINESE PISTACHE | 24" BOX | MEDIUM | 30'-0" | 25'-0" | 1" TO 1-3/4" | STD |
| | 2 | PRU BLI | PRUNUS BLIREANA | PURPLE-LEAFED PLUM | 24" BOX | MEDIUM | 15'-0" | 15'-0" | 1" TO 1-3/4" | NON-FRUITING |
| | 3 | ZEL SER | ZELKOVA SERRATA | ZELKOVA | 36" BOX | MEDIUM | 65'-0" | 65'-0" | 1-3/4" TO 2-1/2" | STD |

### SHRUBS AND GROUNDCOVERS

| SYMBOL | ABBR. | SCIENTIFIC NAME | COMMON NAME | SIZE | SPACING | WATER USE |
|---|---|---|---|---|---|---|
| | ANI | ANIGOZANTHOS 'YELLOW GEM' | KANGAROO PAW | 1 GALLON | 2'-6" | MEDIUM |
| | AGA | AGAPANTHUS 'RANCHO WHITE' | AGAPANTHUS | 1 GALLON | 1'-6" | MEDIUM |
| | BUL FRU | BULBINE FRUTESCENS | STALKED BULBINE | 1 GALLON | 2'-0" | LOW |
| | CAL ACU | CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' | FEATHER REED GRASS | 1 GALLON | 3'-0" | MEDIUM |
| | CHA FLO | CHASMANTHE FLORIBUNDA | AFRICAN CORNFLAG | 1 GALLON | 1'-0" | LOW |
| | COT COG | COTINUS COGGYGRIA 'ROYAL PURPLE' | PURPLE SMOKE TREE | 15 GALLON | AS SHOWN | LOW |
| | FES CAL | FESTUCA CALIFORNICA | CALIFORNIA FESCUE | 1 GALLON | 3'-0" | LOW |
| | FES GLA | FESTUCA GLAUCA 'SISKIYOU BLUE' | BLUE FESCUE | 1 GALLON | 1'-0" | LOW |
| | GAU LIN | GAURA LINDHEIMERI | GAURA | 1 GALLON | 3'-0" | LOW |
| | GRE LAV | GREVILLEA LAVANDULACEA 'PENOLA' | LAVENDER GREVILLEA | 5 GALLON | 6'-0" | LOW |
| | HES PAR | HESPERALOE PARVIFLORA | RED YUCCA | 5 GALLON | 5'-0" | LOW |
| | MUH RIG | MUHLENBERGIA RIGENS | DEERGRASS | 5 GALLON | 6'-0" | LOW |
| | PER ATR | PEROVSKIA ATRIPLICIFOLIA | RUSSIAN SAGE | 1 GALLON | 3'-0" | LOW |
| | RIB SAN | RIBES SANGUINEUM 'INVERNESS WHITE' | RED FLOWERING CURRANT | 5 GALLON | AS SHOWN | LOW |
| | SAL SON | SALVIA SONOMENSIS | SONOMA SAGE | 1 GALLON | 5'-0" | LOW |
| | STA BYZ | STACHYS BYZANTINA | LAMB'S EARS | 1 GALLON | 3'-0" | LOW |
| | TAG LEM | TAGETES LEMMONII | MEXICAN MARIGOLD | 1 GALLON | 4'-0" | LOW |
| BIORENTION PLANTING MIX | | | | | | |
| | CAR DEN | CAREX DENSA | DENSE SAGE | 1 GALLON | 1'-6" | MEDIUM |
| | CHO TEC | CHONDROPETALUM TECHTORUM | DWARF CAPE RUSH | 1 GALLON | 4'-0" | LOW |
| | JUN PAT | JUNCUS PATENS 'ELK BLUE' | ELK BLUE CALIFORNIA GRAY RUSH | 1 GALLON | 2'-0" | LOW |
| | MIM AUR | MIMULUS AURANTIACUS | BUSH MONKEY FLOWER | 1 GALLON | 4'-0" | LOW |
| | POL MUN | POLYSTICHUM MUNITUM | SWORD FERN | 1 GALLON | 2'-0" | LOW |

### TURF

| | |
|---|---|
| | TURF SOD, SEE SPECS. |

## PLANTING NOTES

1. REFER TO SPECIFICATIONS FOR SOIL PREPARATION, PLANTING, AND MAINTENANCE PERIOD REQUIREMENTS.
2. CONTRACTOR TO REFER TO PLANT LIST FOR PLANT SIZE AND SPACING. USE TRIANGULAR SPACING UNLESS OTHERWISE NOTED.
3. PLANT QUANTITIES ARE PROVIDED FOR CONTRACTOR'S CONVENIENCE ONLY. CONTRACTOR TO VERIFY ALL PLANT QUANTITIES SHOWN IN PLANTING PLANS.
4. CONTRACTOR TO SUBMIT PLANT SAMPLES FOR APPROVAL BY LANDSCAPE ARCHITECT, SEE SPECS.
5. LANDSCAPE ARCHITECT TO INSPECT PLANTING LAYOUT PRIOR TO INSTALLATION. CONTRACTOR TO PROVIDE 10' X 10' MOCKUP OF ALL PLANT MIXES FOR APPROVAL BY LANDSCAPE ARCHITECT.
6. CONTRACTOR TO VERIFY LOCATION AND DEPTH OF ALL UTILITIES, STRUCTURES, AND IRRIGATION LINES BEFORE DIGGING.
7. GROUNDCOVERS ARE TO EXTEND UNDER TREE AND SHRUB PLANTINGS FOR FULL COVERAGE. SPACE GROUNDCOVER 18" AWAY FROM TREES AND 12" AWAY FROM SHRUBS.
8. SEE GRADING PLAN FOR FINISH GRADES. ALL FINISH GRADES REFER TO FINISH GRADE OF MULCHED LANDSCAPE.
9. ALL PLANTING AREAS, PLANTERS, AND POTS TO RECEIVE 3" OF MULCH, SEE SPECS.
10. OWNER FURNISHED CONTRACTOR INSTALLED. TREE IS LOCATED AT 250 ANZA BLVD, BURLINGAME, CA 94010


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THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

# WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA

**850 BURLINGAME AVE**
**BURLINGAME**
**CA 94010**

LICENSED LANDSCAPE ARCHITECT
Nathan Lipschitz
Signature
04/30/19
Renewal Date
03/25/19
Date
STATE OF CALIFORNIA

| | |
|---|---|
| Project Arch. | ---- |
| CA REG. | ---- |
| PROJECT: | 12421-04 |

| ISSUE | DATE |
|---|---|
| SCHEMATIC DESIGN | 11/02/18 |
| BID SET | 3/25/19 |
| 1 ADDENDUM #1 | 4/18/19 |

SHEET TITLE AND NO.

**PLANTING NOTES & LEGEND**

**L7.0**

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THE CITY OF BURLINGAME CALIFORNIA INCORPORATED 1908

# WASHINGTON PARK PLAYGROUND, SPORTS COURT, AND PICNIC AREA

**850 BURLINGAME AVE**
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**CA 94010**

LICENSED LANDSCAPE ARCHITECT
Nathan Lindenberg
Signature
04/26/19
"Renewal" Date
03/26/19
Date
STATE OF CALIFORNIA

| | |
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| Project Arch. | ---- |
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SHEET TITLE AND NO.
**PLANTING PLAN**

**L7.2**

# SECTION 02700

# STORM DRAINAGE

## PART 1 GENERAL

### 1.01 SUMMARY

A. Section Includes:

1. Storm Drainage System.

B. Related Documents:

1. The Contract Documents, as defined in the General Conditions, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other documents.

### 1.02 SUBMITTALS

A. Storm Drain Structures

B. Pipe and appurtenances.

C. Schedule for testing.

### 1.03 QUALITY ASSURANCE

A. Work shall comply with the Contract Documents.

B. Contractor qualifications.

### 1.04 PROJECT CONDITIONS

A. Coordination: Coordinate this work with the work of other Sections to avoid any delay or interference with other work.

B. Bonds: All surety bonds for performance required by local regulatory agencies shall be provided by the Contractor at no additional cost to Owner.

## PART 2 PRODUCTS

2.01 MATERIALS - STORM DRAIN

A. Solid wall Polyvinyl Chloride Pipe (PVC): 8” to 24” shall be PVC C900/C905, minimum DR-25, having elastomeric gasket joints with ends of pipe formed so that pipe will form a continuous line with a smooth interior surface when the pipes are laid together.

All PVC pipe leaving a concrete structure shall have a rubber sealing gasket, as supplied by the pipe manufacturer, firmly seated perpendicular to the pipe axis, around the pipe exterior and cast into the structure base or near the structure wall center as a water stop. The water stop may also consist of a manhole coupling with rubber sealing rings cast into the structure base.

B. Precast Structures: Precast reinforced concrete structures may be used at Contractor's option, but must match dimensions of structures shown on project plans and details.

C. Where existing pipe systems need to be extended to new structures, new pipe shall be of same material as the existing pipe.

D. Manhole Frame and Cover: Manhole frames and covers shall be per City Standard.

E. Perforated Pipe: PVC Schedule 40. Two rows of holes, 120° apart parallel to the axis of the pipe, installed with holes oriented downward. Holes shall be ½” diameter and spaced minimum 5” on

F. Ductile Iron Pipe (DIP): 4” to 36” restrained joint pipe shall be Ductile Iron manufactured in accordance with the requirements of ANSI/AWWA C151/A21.51. Push-on joints for such pipe shall be in accordance with ANSI/AWWA C111/A21.11 "Rubber-Gasket Joints for Ductile-Iron Pipe and Fittings." Pipe thickness shall be designed in accordance with ANSI/AWWA C150/A21.50 “Thickness Design of Ductile-Iron Pressure Pipe,” and shall be based on laying conditions and internal pressures as stated in the project plans and specifications.

1. Fittings: Restrained joint fittings and the restraining components shall be Ductile Iron in accordance with applicable requirements of ANSI/AWWA C110/A21.10 and/or C153/A21.53 with the exception of the manufacturer’s proprietary design dimensions. Push-on joints for such fittings shall be in accordance with ANSI/AWWA C111/A21.11.

2. Braces: All bolts must be tightened to the manufacture’s specifications. All straps, bolts, nuts, and washers shall be Type 316 stainless steel coated with anti-seize. Anchor block and rebar shall conform to drawing A-13 on the Project Plans and to City Standards.

3. Coating: All DIP Pipe and Fittings shall be coated with amine cured and ceramic pigment epoxy in accordance with ANSI 61 and manufacturer’s instructions.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Starting work constitutes acceptance of the existing conditions and the Contractor shall then, at his expense, be responsible for correcting all unsatisfactory and defective work encountered.

### 3.02 TRENCHING, BACKFILLING AND COMPACTION

A. Trenching, backfilling and compacting: In accordance with applicable requirements of Section 02300, Earthwork.

B. Generally, excavate to the line and grade shown. The excavations shall not be carried closer than two inches of final grade until the pipe is ready to be installed. The remaining two inches shall be removed by fine graders just ahead of the pipe laying operation.

C. Backfilling from bottom of trench to a point at least one foot over the top of pipe barrel shall be placed in six inch layers and thoroughly tamped into place around the pipe. Extreme care shall be exercised to the level one foot above pipe barrel to ensure that no damage is caused to the pipe or that its alignment or grade is not disturbed in any way. Only materials of a gradation as shown on the drawings may be used in this operation.

### 3.03 INSTALLATION OF STORM DRAIN BY OPEN TRENCH

A. Install pipelines in straight line and on uniform rate of grade between points where changes in alignment or grade are shown. Bed barrel of pipe firmly at required line and grade. Keep stopper in mouth of pipe when pipe laying is not in progress. Set bell of pipe upstream. Support barrels of pipe continuously and scoop out space for proper clearance of bell.

B. After installed piping has been tested and inspected, backfill excavations with approved material, tamp and compact in place. Tamp carefully around pipe and above top of pipe in layers not over 6 inches. Observe care in backfilling not to disturb pipe.

C. Provide sand bedding and dewatering materials and methods required to facilitate installation.

### 3.04 INSTALLATION OF STORM DRAIN BY DIRECTIONAL DRILLING

A. General: The directional drilling equipment shall consist of a directional drilling rig of sufficient capacity to perform the bore and pull back the pipe, a drilling fluid mixing, delivery and recovery system of sufficient capacity to successfully complete the installation, a drilling fluid recycling system to remove solids from the drilling fluid so that the fluid can be reused (if required), a magnetic guidance system or walk-over system to accurately guide boring operations, a vacuum truck of sufficient capacity to

handle the drilling fluid volume, and trained and competent personnel to operate the system. All equipment shall be in good, safe condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of this project.

1. Drilling Rig: The directional drilling machine shall consist of a hydraulically powered system to rotate and push hollow drilling pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall be anchored to the ground to withstand the pulling, pushing and rotating pressure required to complete the installation. The hydraulic power system shall be self-contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor and record maximum pull-back pressure during pull-back operations. There shall be a system to detect electrical current from the drill string and an audible alarm, which automatically sounds when an electrical current is detected.

2. Drill Head: The drill head shall be steerable by changing its rotation, and shall provide necessary cutting surfaces and drilling fluid jets.

3. Mud Motors (if required): Mud motors shall be of adequate power to turn the required drilling tools.

4. Drill Pipe: Shall be constructed of high quality 4130 seamless tubing, grade D or better, with threaded box and pins. Tool joints should be hardened to 32-36 RC.

5. Guidance System: An electronic walkover tracking system or a Magnetic Guidance System (MGS) probe or proven gyroscopic probe and interface shall be used when there is accessible access to provide a continuous and accurate determination of the location of the drill head during the drilling operation. The guidance shall be capable of tracking at all depths up to fifty feet and in any soil condition, including hard rock. It shall enable the driller to guide the drill head by providing immediate information on the tool face, azimuth (horizontal direction), and inclination (vertical direction). The guidance system shall be accurate and calibrated to manufacturer's specifications of the vertical depth of the borehole at sensing position at depths up to fifty feet and accurate to 2-feet horizontally. The Contractor shall supply all components and materials to install, operate, and maintain the guidance system. The guidance system shall be of a proven type, and shall be set up and operated by personnel trained and experienced with the system. The operator shall be aware of any geo-magnetic anomalies and shall consider such influences in the operation of the guidance system.

6. Mixing System: A self-contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid composed of bentonite clay, potable water, and appropriate additives. Mixing system shall be able to molecularly shear individual bentonite particles from the dry powder to avoid clumping and ensure thorough mixing. The drilling fluid reservoir tank shall be

minimum of 1,000 gallons. Mixing system shall continually agitate the drilling fluid during drilling operations.

7. Drilling Fluids: Drilling fluid shall be composed of clean water and bentonite clay. Water shall be from an authorized source with a pH of 8.5 – 10. Water of a lower pH or with excessive calcium shall be treated with the appropriate amount of sodium carbonate or equal. No additional material may be used in drilling fluid without prior approval from District. The bentonite mixture used shall have the minimum viscosities as measured by a Marsh funnel:

| | |
|---|---|
| Rocky Clay | - 60 seconds |
| Hard Clay | - 40 seconds |
| Soft Clay | - 45 seconds |
| Sandy Clay | - 90 seconds |
| Stable Sand | - 80 seconds |
| Loose Sand | - 110 seconds |
| Wet Sand | - 110 seconds |

These viscosities may be varied to best fit the soil conditions encountered, or as determined by the operator.

8. Delivery System: The mud pumping system shall have a minimum capacity of 35-500 GPM and the capability of delivering the drilling fluid at a constant minimum pressure of 1200 psi. The delivery system shall have filters in-line to prevent solids from being pumped into drill pipe. Used drilling fluid and drilling fluid spilled during operations shall be contained and conveyed to the drilling fluid recycling system or shall be removed by vacuum trucks or other methods acceptable to District. A berm, minimum of 12-inches high, shall be maintained around drill rigs drilling fluid mixing system, entry and exit pits and drilling fluid recycling system to prevent spills into the surrounding environment. Pumps and or vacuum truck(s) of sufficient size shall be in place to convey drilling fluid from containment areas to storage and recycling facilities for disposal.

9. Restrictions: Other devices or utility placement systems for providing horizontal thrust other than those previously defined in the preceding sections shall not be used unless approved by the District prior to commencement of the work. Consideration for approval will be made on an individual basis for each specified location. The proposed device or system shall maintain line and grade within the tolerances prescribed by the particular conditions of the project.

B. Installation Tolerances

1. Pilot Hole: The pilot hole shall follow the design path of the bore shown on the drawings.

2. Horizontal and Vertical Tolerances: Horizontal deviations shall be less than six (6) inches from the design centerline. Vertical deviations shall be less than plus or

minus two inches from the pipeline invert elevation shown with proper clearance between all existing utilities. The Contractor shall continuously monitor horizontal and vertical position and record the position at least once per drill stem length, or at 10 foot or 30-minute intervals, whichever is most frequent.

3. Entry and Exit Tolerances: The location of the entry and exit points shall be consistent with the lines and grades shown on the Contract Drawings.

C. Insertion Pits

Insertion pits shall have vertical walls. Trenching machines may be used except where their use may result in damage in existing facilities. Unless otherwise specified or indicated, the Contractor may use any method of excavation, which will not damage nearby utilities or endanger adjacent structures or property or disturb the natural or fill soils at, below and adjacent to the excavation.

Where drain rock is required to stabilize a soft, wet or spongy ground, in the District's opinion the Contractor shall use a bedding material. Insertion pits for pipe installation shall be excavated to twelve (12) inches minimum below the pipe invert or per soil conditions.

Insertion area length shall be thirty (30) feet in length and width shall be such that pipe assembly is achieved per manufactures recommendation and work conditions are optimum. The excavation shall be properly braced and shored.

Backfill and Restoration of insertion pit upon completion of pullback operation and pipe testing shall be done to match existing conditions. Trench shall be backfilled per Construction Drawings with warning tape.

D. Daily Logs and Records

Daily logs and records shall be maintained by the Contractor, documenting drilling lengths, location of drill head, drilling fluids pressures and flow rates, down-hole annular pressures, drilling fluid losses, inadvertent returns, drilling times required for each pipe joint, any instances of retraction and re-drilling of the pilot bore or segments thereof, and any other relevant observations. The drilling fluid pressures shall be measured at the entry point and at the injection nozzle. These records shall be maintained and updated daily throughout the course of the project, or more frequently as directed by the District. The position of the drill head shall be continuously tracked. Daily logs shall be submitted complete and legible as directed by the District, within one (1) working day of the date to which the records correspond.

E. Execution

1. The Contractor shall provide at least 72 hours advance written notice to the District of the planned inception of drilling activities, including pilot hole launch, pre-reaming, reaming, and pipe pullback. The Contractor shall immediately

notify the District, in writing, when any significant problems. All work by the Contractor shall be performed in the presence of the District, unless District grants prior written approval to perform such work in The District's absence.

2. The Contractor shall provide all material, equipment, and facilities required for directional drilling. Proper alignment and elevation of the bore hole shall be consistently maintained throughout the directional drilling operation.

3. The entire drill path shall be accurately surveyed with entry and exit stakes placed in the appropriate locations within the areas indicated on drawings. If Contractor is using a Magnetic Guidance System (MGS), drill path will be surveyed for any surface geo-magnetic variations or anomalies.

4. Readings shall be recorded after advancement of each successive drill pipe (no more than 10') and the readings plotted on a scaled drawing of 1" = 2', both vertical and horizontal. Access to all recorded readings and plan and profile information shall be made available to the District, or his representative, at all times. At no time shall the deflection radius of the drill pipe exceed the deflection limits of the carrier pipe as specified herein.

5. A complete list of all drilling fluid additives and mixtures to be used in the directional operation will be submitted to the District, along with their respective Material Safety Data Sheets. All drilling fluids and lose cuttings shall be contained in pits or holding tanks for recycling or disposal, no fluids shall be allowed to enter any unapproved areas or natural waterways. Upon completion of the directional drill project, the drilling mud and cuttings, and all other fluids shall be disposed of by the Contractor at an approved dumpsite. All associated costs with disposing shall be included in the cost of pipe installation and shall not be considered additional cost to the District.

6. The pilot hole shall be drilled on bore path with no deviations greater than the acceptable tolerances. In the event of deviation exceeding the specified tolerance from the bore path, the contractor will notify the District immediately and the District may require the Contractor to pull-back and re-drill from the location along bore path before the deviation. In the event that a drilling fluid fracture, inadvertent returns or returns loss occurs during pilot hole drilling operations, Contractor shall cease drilling, and wait at least 30 minutes, inject a quantity of drilling fluid with a viscosity exceeding 120 seconds as measured by a Marsh funnel and wait another 30 minutes. If mud fracture or returns loss continues, Contractor will discuss additional options with the District and work will then proceed accordingly.

7. Upon completion of the pilot hole phase of the operation, a complete set of "as-built" records shall be submitted in duplicate to the District. These records shall include copies of the plan and profile drawing, as well as directional survey reports as recorded during the drilling operation.

8. Upon approval of the pilot hole location, the hole opening or enlarging phase of the installation shall begin. The bore hole diameter shall be increased to accommodate the pullback operation of the required size to install the three pipes. The type of hole opener or back reamer to be utilized in this phase shall be determined by the types of subsurface soil conditions that have been encountered during the pilot hole drilling operation. The reamer type shall be at the Contractor's discretion with the final hole opening being a maximum of 1.5 times larger than the outside diameter of the pipes combined.

9. The open bore hole may be stabilized by means of bentonite drilling slurry pumped through the inside diameter of the drill rod and through openings in the reamer. The drilling slurry must be in a homogenous / flowable state serving as an agent to carry the loose cuttings to the surface through the annulus of the borehole. The volume of bentonite mud required for each pullback shall be calculated based on soil conditions, largest diameter of the pipe couplings, capacity of the bentonite mud pump, and the speed of pullback as recommended by the bentonite drilling fluid manufacture. The bentonite slurry is to be contained at the exit or entry side of the directional bore in pits or holding tanks. The slurry may be recycled at this time for reuse in the hole opening operation, or shall be hauled by the Contractor to an approved dumpsite for proper disposal.

10. The Contractor shall utilize a "weak link" or breakaway device at the leading end of the pipe to protect the pipe from excessive pulling loads. The weak link device shall be installed between the drilling head and the regular pipe. Connection details and calculations used to determine the weak link material and size shall be subject to the approval of the District.

## 3.05 CONSTRUCTION OF DRAINAGE STRUCTURES

A. Structures shall be set on properly prepared granular or concrete subbase providing full support to unit.

B. Structures shall be placed and backfilled as detailed and per Section 02300, Earthwork.

C. SAFE MANHOLE ENTRY

The Contractor shall conform to all applicable occupational safety and health standards, rules, regulations and orders established by Federal and State Agencies

The atmospheric condition in manhole shall be tested for possible oxygen deficiency and the presence of poisonous, toxic or explosive gases before entering. Sufficient ventilation shall be provided to ensure the safety of workers working in the manhole. The Contractor is required to provide all safety equipment for manhole entry and appropriate attire is required for those who are working in a manhole.

Specific attention is directed also to OSHA safety rules, regulations and precautions to be taken by the Contractor before entering manholes, trenches, and other structures with respect to physical and chemical hazards which may be present.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work involved and no separate payment will be made therefore.

3.06 FIELD QUALITY CONTROL

A. Tests:

1. Ball Test: Prior to other tests all lines should be cleaned and tested for major defects by flushing with an appropriately sized cleaning ball. Precleaning by high velocity jet or other method may be necessary.

2. Visual Test: All pipelines shall be inspected visually by the Contractor to verify accuracy of alignment and freedom from debris and obstructions. The full diameter of the pipe should be visible when viewed between consecutive manholes. The method of test shall be closed circuit television. The video shall be provided to the City for review and approval. If found unacceptable, the Contractor will make necessary repairs or cleaning and re-televise at their own expense.

3.07 STORM DRAIN ABANDONMENT

A. All pipe lines/culverts to be abandoned shall be filled with slurry and ends capped with 12” concrete. Cost for abandonment shall be included in unit costs for construction of new facilities.

B. All structures to be abandoned shall have the top two feet of the structure removed completely. Structures to be filled with slurry. Outlet/inlet pipes shall be capped with 12” concrete. Finished surface shall be asphalt, concrete, sod, or soil, as shown on Construction Documents.

3.08 CLEANING AND TELEVISING

A. All existing pipelines to be lined as well as all new pipelines shall be inspected for obstructions and shall be cleaned and televised by the Contractor. All pipelines shall be cleaned using the sewer ball method or a high-pressure hydroflusher. If the Contractor elects to use the high-pressure hydroflusher, and if, in the opinion of the City, the lines are not cleaned sufficiently by hydroflushing, the Contractor shall re-clean the lines using the sewer ball method at his own expense. Additional costs for television inspection of the work after re-cleaning shall be borne by the Contractor. Copies of CDs and electronic TV logs shall be provided to the City by the Contractor.

***** END OF SECTION *****

# SECTION 33 41 00 – STORM UTILITY DRAINAGE PIPING

REFER TO CITY OF BURLINGAME STORM DRAINAGE SPECIFICATION SECTION 02700

ADDENDUM #1

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

A. Roadway and/or site storm drainage system up to five feet of any on-site building

### 1.2 RELATED SECTIONS

A. Section 31 21 00, Utility Trenching and Backfill

B. Section 32 13 18, Cement and Concrete for Exterior Improvements

### 1.3 RELATED DOCUMENTS

A. AASHTO
1. M199: Precast Reinforced Concrete Manhole Sections
2. M252: Corrugated Polyethylene Drainage Pipe
3. M294: Corrugated Polyethylene Pipe, 12 to 604 inch Diameter

B. ASTM
1. A74: Cast Iron Soil Pipe and Fittings
2. A615: Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
3. C143: Standard Test Method for Slump of Hydraulic-Cement Concrete
4. C443: Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
5. C478: Circular Precast Reinforced Concrete Manhole Sections
6. C564: Rubber Gaskets for Cast Iron Soil Pipe and Fittings
7. C923: Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals
8. C1173: Flexible Transition Couplings for Underground Piping Systems
9. D1785: Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
10. D2321: Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications
11. D2564: Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems
12. D3034: Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
13. D4101: Propylene Injection and Extrusion Materials
14. F477: Elastomeric Seals (Gaskets) for Joining Plastic Pipe
15. F656: Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings
16. F679: Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
17. F1336: Poly(Vinyl Chloride) (PVC) Gasket Sewer Fittings

C. AWWA
1. C104: Cement-Mortar Lining for Ductile-Iron Pipe and Fittings
2. C105: Polyethylene Encasement for Ductile-Iron Pipe Systems

3. C110: Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. for Water
4. C111: Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
5. C115: Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges
6. C116: Protective Fusion-Bonded Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings
7. C150: Thickness design of Ductile Iron Pipe
8. C151: Ductile-Iron Pipe, Centrifugally Cast
9. C153: Ductile-Iron Compact Fittings
10. C219: Bolted, Sleeve-type Couplings for Plain-End Pipe
11. M41: Ductile Iron Pipe and Fittings

D. Caltrans Standard Specifications, 2015
1. Section 51, Concrete Structures
2. Section 52, Reinforcement
3. Section 65, Concrete Pipe
4. Section 66, Corrugated Metal Pipe
5. Section 70, Miscellaneous Drainage Facilities
6. Section 72, Slope Protection
7. Section 75, Miscellaneous Metal
8. Section 90, Concrete

E. Caltrans Standard Plans, 2015
1. Plan D94A: Metal and Plastic Flared End Sections
2. Plan D94B: Concrete Flared End Sections
3. Plan D97A: Corrugated Metal Pipe Coupling Details No. 1, Annular Coupling Band Bar and Strap and Angle Connection
4. Plan D97C: Corrugated Metal Pipe Coupling Details No. 3, Helical and Universal Couplers
5. Plan D97D: Corrugated Metal Pipe Coupling Details No. 4, Hugger Coupling Bands
6. Plan D97E: Corrugated Metal Pipe Coupling Details No. 5, Standard Joint
7. Plan D97F: Corrugated Metal Pipe Coupling Details No. 6, Positive Joint
8. Plan D97G: Corrugated Metal Pipe Coupling Details No. 7, Downdrain
9. Plan D98A: Slotted Corrugated Steel Pipe Drain Details
10. Plan D98B: Slotted Corrugated Steel Pipe Drain Details

## 1.4 DEFINITIONS

A. AASHTO: American Association of State Highway and Transportation Officials

B. ASTM: American Society for Testing Materials

C. AWWA: American Water Works Association

D. CMP: Corrugated metal pipe

E. DIP: Ductile iron pipe

F. HDPE: High-density polyethylene

G. NPS: Nominal pipe size

H. PE: Polyethylene

I. PVC: Polyvinyl Chloride

J. RCP: Reinforced concrete pipe

1.5 SUBMITTALS

A. Follow submittal procedure outlined in Section 01 10 00, Supplemental General Requirements.

B. Product data for the following:
1. Piping materials and fittings
2. Special pipe couplings
3. Polymer-concrete, channel drainage systems (trench drains)
4. Joint sealants
5. Plastic area drains
6. Cleanout plugs or caps
7. Precast concrete catch basins, inlets, curb inlets, junction structures and area drains, including frames and grates
8. Precast clean out boxes and box covers
9. Concrete, metal and plastic flared end sections
10. Sanitary sewer and storm drain manholes

C. Shop drawings: Include plans, elevations, details and attachments for the following:
1. Precast concrete manholes, frames and covers

D. Design Mix Reports and Calculations: For each class of cast in place concrete

E. Field Test Reports: Indicate and interpret test results for compliance with performance.

1.6 DELIVERY, STORAGE AND HANDLING

A. Delivery and Storage
1. Piping: Inspect materials delivered to site for damage; store with minimum of handling. Store materials on site in enclosures or under protective coverings. Store plastic piping and jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.
2. Metal Items: Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

B. Handling
1. Handle pipe, fittings, and other accessories in such manner as to ensure delivery to the trench in sound undamaged condition. When handling lined pipe, take special care not to damage linings of pipe and fittings; if lining is damaged, make satisfactory repairs. Carry, do not drag, pipe to trench.
2. Handle precast concrete pipe, manholes and other precast structures according to manufacturer's written instructions.

3. Protect imported bedding and backfill material from contamination by other materials.

PART 2 - PRODUCTS

2.1 REFER TO THE CITY OF BURLINGAME STORM DRAINAGE SPEC SECTION 02700

2.2 PIPE CLEANOUTS

ADDENDUM # 1

A. Piping: Same as storm drain line if possible

B. Top Plug or Cap: Same material as piping if possible. Plug or cap to be secure but removable, threaded or non-threaded.

C. Box Size: As required to provide access and allow easy removal and reinstallation of cap

D. Box Types
1. Non-Traffic Areas: Portland cement concrete box and box cover, light duty
2. Traffic Areas: Portland cement concrete box and box cover or steel or cast iron cover, heavy duty, both box and cover to be rated for AASHTO H20 loading

E. Box Cover Markings: "S.D.," unless otherwise specified

F. Available Manufacturers: Subject to compliance with requirements, box manufacturers offering products that may be incorporated into the Project include, but are not limited to the following:
1. Associated Concrete Products, Inc.
2. Brooks Products Inc.
3. OldCastle Precast/Christy Concrete Products, Inc.

2.3 AREA DRAINS

A. Grate and Riser: Area drain shall be as manufactured by Nyloplast or approved equal. Riser shall be constructed of 6 inch PVC C900/C905 SDR 25 piping per paragraph 2.1(A) of this section and connected to area drain by a gasket joint. Riser shall be vertical except as otherwise noted in the plans. Riser may include a reducer if necessary to make connection to the storm drain line.

B. Elevation and Grading: Area Drain rim elevation shall be set and area around area drain shall be graded to drain away from any adjacent structures, walks, or roadways and towards area drain.

2.4 CURB INLETS, CATCH BASINS, DROP INLETS, JUNCTION STRUCTURES, AREA DRAINS, ETC.

A. General: Size, shape, configuration, depth, etc. of structure and frame, grate, or cover shall be as indicated.

B. Portland Cement Concrete and Reinforcing: Section 32 13 18, Cement and Concrete for Exterior Improvements.

C. Precast Structure: Rate for AASHTO H20 loading in traffic areas.

If required, steps: ASTM C 478 or AASHTO M199. Manufacture from deformed, ½ inch steel reinforcement rod complying with ASTM A615 and encased in polypropylene complying with ASTM D4101. Include pattern designed to prevent lateral slippage off step. Acceptable manufacturer is Hanson Concrete Products, (Milpitas, CA) (Tel 408-262-1091).

D. Frames, Grates and Covers: Caltrans Standard Specification Section 75-1.02, 75-1.02.B and 75-2
1. Galvanize steel frames, grates and covers
2. Grates and covers shall be non-rocking
3. Rate for AASHTO H20 loading in traffic areas

2.5 MANHOLES

A. Manholes shall be pre-cast concrete of the size and shape shown on the Plans and shall conform to ASTM C478. Equivalent poured-in-place structures may be used at the Contractor's option. Concrete shall consist of Caltrans Type I/II cement. Rate for AASHTO H20 loading in traffic areas.

B. All interior concrete surfaces shall be coated with "Xypex Crystalline" or approved equivalent. Use of a water-resistant admix is acceptable, at Contractor option.

C. Frames and Covers: As indicated and in accordance with Caltrans Standard Specification Section 75-2.02B. Manhole covers shall have the words "STORM DRAIN" in letters not less than 2 inches cast into the cover. The clear opening for all manhole covers shall be 24 inches.

D. Frames and lids for manholes shall be match-marked in pairs before delivery to the job site. The lids shall fit into their frames without rocking.

E. Reinforcing Bars: Reinforcing bars shall be of intermediate grade billet steel conforming to ASTM A615 and shall be of the size shown on the Standard Details or in the Plans. Bars shall be of the round deformed type, free from injurious seams, flaws, or cracks, and shall be cleaned of all rust, dirt, grease and loose scales.

F. Portland Cement Concrete: Concrete for manhole bases, inlets, and other concrete structures shall conform to the requirements of Caltrans Standard Specifications Section 90 and as herein specified. The concrete shall be Class "A" containing six (6) sacks of portland cement per cubic yard of concrete. The grading of the combined aggregate shall conform with the CDT requirements of the three-quarter inch maximum. The consistency of the fresh aggregate shall be such that the slump does not exceed four inches, as determined by ASTM C143. The concrete shall have a minimum design compressive strength of 3,000 psi after 28 days.

If required, steps: ASTM C478 or AASHTO M199. Manufacture from deformed, ½ inch steel reinforcement rod complying with ASTM A615 and encased in polypropylene complying with ASTM D4101. Include pattern designed to prevent lateral slippage off step. Acceptable manufacturer is Hanson Concrete Products, or approved equal.

## 2.6 JOINT SEALANT FOR PRECAST STRUCTURES AND MANHOLES

A. Mortar: Caltrans Standard Specification Section 51-1.02F
   1. Use to seal around pipes at connections to structures and manholes. Also use to seal joints between precast sections of structures and manholes.

B. Gaskets: Preformed flexible rubber or plastic gasket
   1. Rubber Gaskets: ASTM C443
   2. Plastic Gaskets: Federal Specification SS-S-00210 (GSA-FSS), Type I, Rope Form; or alternate standard which may exist. Acceptable material is "Ram-Nek," as manufactured by Henry Company, or approved equal.

## 2.7 PIPE TO STRUCTURE CONNECTOR/SEAL

A. A flexible pipe to manhole connector shall be used for all pipe penetrations to pre-cast and/or cast-in-place concrete structures.
   1. The seal shall provide a flexible, positive, watertight connection between pipe and concrete wastewater structures. The connector shall assure that a seal is made between (1) the connector and the structure wall, and (2) between the connector and the pipe. The seal between the connector and the manhole wall shall be made by casting the connector integrally with the structure wall during the manufacturing process in such a manner that it will not pull out during coupling. The seal between connector and pipe will be made by way of a stainless steel take down band compressing the gasket against the outside diameter of the pipe.
   2. The connector shall be molded from materials whose physical/chemical properties meet or exceed the physical/chemical resistant properties outlined in ASTM C923. The connector and stainless steel hardware shall meet or exceed the performance requirements proscribed in ASTM C923.
   3. The connector shall be of size specifically designed for the pipe material being used and shall be installed in accordance with recommendations of the manufacturer.
   4. Connectors shall be Z-LOK or G3 connectors manufactured by A-LOK Products Inc. or approved equivalent.

## 2.8 POLYMER-CONCRETE TRENCH DRAINS

A. General: Modular system of precast, polymer-concrete channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling. Include number of units required to form total length required.

B. Include the following components:
   1. Channel Sections: Interlocking-joint, precast modular units with end caps. Inside width as indicated with deep, rounded bottom, with built in slope or flat invert as indicated and outlets in number, sizes, and locations indicated. Include extension sections necessary for required depth.
   2. Frame and Grate: Gray iron, ductile iron or galvanized steel as indicated. Where drain is located in traffic areas, rate for AASHTO H20 loading.

C. Locking Mechanism: Manufacturer's standard device for securing grates to channel sections.

D. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:
   1. "Polydrain" by ABT Inc.
   2. "ACO Drain" by ACO Polymer Products Inc. , or approved equal

PART 3 - EXECUTION

3.1 PIPE INSTALLATION

A. General: Install pipe, fittings, and appurtenances utilizing best practices, manufacturer's instructions, and in accordance with Section 6 and 7 of ASTM D 2321 for plastic pipe, Caltrans Standard Specification Section 65-2.03 for reinforced concrete pipe, Caltrans Standard Specification Section 66-1.03 for corrugated metal pipe, and chapter 11.3.3 of AWWA M41 for cast iron and ductile iron pipe.

B. Pipe Depth and Trench Configuration: Conform to typical trench section(s) indicated.

C. Excavation, Bedding, Backfill, and Compaction: Section 31 21 00, Utility Trenching and Backfill

D. Handling: Carefully handle during loading, hauling, unloading and placing operations to avoid breakage or damage. Use strap type slings for lifting and placing; no chains or hooks will be permitted. Comply with the manufacturer's recommendations.

E. Laying: Before lowering pipe into the trench, remove all stakes, debris, loose rock and other hard materials from the bottom of the trench. Lay accurately in conformance with lines and grades indicated. Start laying the pipeline at the low end and proceed upstream. Lay bell and spigot pipe with the bell end facing upstream. Lay pipe on a bed prepared by handwork, dug true to grade. Furnish firm bearing for pipe throughout its entire length with bell holes provided at the ends of each pipe length of sufficient size to permit making up the particular type of joint being used. Adjust pipe to line and grade by scraping away or filling and tamping material under the body of the pipe for the entire pipe length and not by blocking or wedging. After final positioning, hold pipe in place in trench with backfill material placed equally on both sides of the pipe at as many locations as required to hold the pipe section in place.

F. Curved Alignment: When necessary to conform to the alignment specifically indicated, lay pipe on a curved alignment by means of asymmetrical closure of joints or bending of the pipe barrel. Use shorter lengths of pipe than the standard length if necessary to achieve curvature specified. Do not exceed the recommendations of the pipe manufacture for deflections at the joints or pipe bending.

G. Closure: Close open ends of pipes and appurtenance at the end of each day's work or when work is not in progress.

3.2 SPECIAL PIPE COUPLINGS

A. General: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.

B. Installation: Manufacturers' instructions

3.3 INSTALLATION OF CURB INLETS, CATCH BASINS, DROP INLETS, JUNCTION STRUCTURES, AREA DRAINS, ETC. AND MANHOLES

A. Excavation, Bedding, Backfill, and Compaction: Section 31 21 00, Utility Trenching and Backfill

B. Poured in Place Structures: Install as indicated and Caltrans Standard Specification Section 51.
   1. Shape bottoms to convey flows as indicated.

C. Precast Structures: Install as indicated.
   1. Seal all joints and pipe entrances and exits.
   2. Place concrete in bottom and shape to convey flows as indicated.

3.4 POLYMER-CONCRETE TRENCH DRAIN INSTALLATION

A. Excavation, Bedding, Backfill, and Compaction: Section 31 21 00, Utility Trenching and Backfill

B. Install: As indicated and in accordance with the manufacturer's instructions.

3.5 SLOPE PROTECTION PLACEMENT

A. Rock Slope Protection: Caltrans Standard Specification Section 72-2.03 and as indicated.
   1. Use Method B Placement unless otherwise indicated.

B. Concrete/Shotcrete Slope Protection: Caltrans Standard Specification Section 72-5.03

C. Concreted-Rock Slope Protection: Caltrans Standard Specification Section 72-3.03
   1. Use Method B Placement unless otherwise indicated.

D. Sacked Concrete Slope Protection
   1. Detailed configuration: As indicated
   2. Use one cubic foot of concrete per sack.
   3. Locate headers and stretchers as indicated.
   4. Headers: Folded end to bank
   5. Stretchers: Folded ends are not to be adjacent.
   6. Place no more than four vertical courses until initial set has taken place in first course.

3.6 POURED-IN-PLACE CONCRETE

A. Concrete shall be mixed in accordance with applicable provisions of Section 90 of Caltrans Standard Specifications.

B. Construction of concrete structures shall conform to applicable provisions of Section 51 of the Caltrans Standards Specifications. Unless otherwise noted herein or in the Plans, exposed surfaces of structures shall be Class 1 surface finish.

C. Curing shall conform to applicable portions in Section 90 of Caltrans Standard Specifications. No pigment shall be used in curing compounds. All work shall be subject

to inspection. No concrete shall be placed until the Project Manager has approved the forms and reinforcement.

D. Concrete shall not be cropped freely where reinforcing bars will cause segregation, nor shall it be dropped freely more than six feet. Spouts, elephant trunks, or other approved means shall be used to prevent segregation.

## 3.7 PIPELINE FLUSHING

A. Newly constructed storm drain pipes shall be flushed with water to clean. A metal screen shall be used to collect and remove any rock, silt and other debris that is flushed out during cleaning.

## 3.8 DEFLECTION TESTING

A. Upon completion of work, perform a deflection test on entire length of installed plastic pipeline. Completed work includes superimposed loads adjacent to and over the pipeline, such as compacted backfill and earthwork, and does not include paving, concrete curbs and gutters, sidewalks, walkways, and landscaping.

B. Under external loads, deflection of pipe in the installed pipeline shall not exceed 4.5 percent of the average inside diameter of pipe.

C. Determine whether the allowable deflection has been exceeded by use of a pull-through device or a deflection-measuring device.

D. Pull-Through Device:

1. Provide a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft.
   a. Circular sections shall be so spaced on the shaft that distance from external faces of front and back sections will equal or exceed diameter of the circular section.
   b. Pull-through device may also be of a design approved by the Uni-Bell Plastic Pipe Association, provided that the device meets the applicable requirements specified in this paragraph, including those for diameter of the device.
2. Ball, cylinder, or circular sections shall conform to the following:
   a. A diameter, or minor diameter as applicable, of 95 percent of the average inside diameter of the pipe; tolerance of plus 0.5 percent will be permitted.
   b. A homogeneous material throughout, with a density greater than 1.0 as related to water at 39.2 degrees F, and a surface Brinell hardness of not less than 150.
   c. Center bored and through bolted with a ¼ inch minimum diameter steel shaft having a yield strength of not less than 70,000 pounds per square inch, with eyes or loops at each end for attaching pulling cables.
   d. Each eye or loop shall be suitably backed with a flange or heavy washer such that a pull exerted on opposite end of shaft will produce compression throughout remote end.
3. Pull-Through Device:

a. Pass the pull-through device through each run of pipe, either by pulling it through or flushing it through with water.

b. If the device fails to pass freely through a pipe run, replace pipe which has the excessive deflection and completely retest in same manner and under same conditions as specified.

E. Deflection measuring Device:

1. Sensitive to 1.0 percent of the diameter of the pipe being tested and accurate to 1.0 percent of the indicated dimension.
2. Obtain approval of deflection measuring device prior to use.

F. Deflection Measuring Device Procedure:

1. Measure deflections through each run of installed pipe.
2. If deflection readings in excess of 4.5 percent of average inside diameter of pipe are obtained, retest pipe by a run from the opposite direction.
3. If retest continues to show a deflection in excess of 4.5 percent of average inside diameter of pipe, remove pipe which has excessive deflections, replace with new pipe, and completely retest in same manner and under same conditions.

G. Warranty Period Test: Pipe found to have a deflection of greater than 5 percent of average inside diameter when deflection test is performed just prior to end of 1 year warranty period shall be replaced with new pipe and tested as specified for leakage and deflection.

## 3.9 CLEANING

A. Thoroughly clean storm drain lines, manholes, catch basins, field inlets, culverts, and similar structures, of dirt, debris, and obstructions of any kind.

## 3.10 TELEVISION INSPECTION

A. After completion of the pipe installation, service connections, flushing and cleaning, and prior to placement of pavement, the drain line shall be televised with a color closed-circuit television with tilt-head camera recorded in DVD format. The original disc and log sheets shall be provided to the Owner for review.

B. The following observations from television inspections will be considered defects in the construction of sewer pipelines and will require correction prior to placement of pavement:

1. Low spot (1 inch or greater - mainlines only)
2. Joint separations (3/4 inch or greater opening between pipe sections)
3. Cocked joints present in straight runs or on the wrong side of pipe curves.
4. Chips in pipe ends
5. Cracked or damaged pipe
6. Dropped joints
7. Infiltration
8. Debris or other foreign objects
9. Other obvious deficiencies
10. Irregular condition without logical explanation

END OF SECTION

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**AGREEMENT FOR PUBLIC IMPROVEMENT**

**WASHINGTON PARK PLAYGROUND, SPORTS COURT, & PICNIC AREA**

**CITY PROJECT 85670**

THIS AGREEMENT, made in duplicate and entered into in the City of Burlingame, County of San Mateo, State of California on _____, 2019 by and between the CITY OF BURLINGAME, a Municipal Corporation, hereinafter called "City", and _____, a [State of incorporation] [Corporation or other form of business], hereinafter called "Contractor."

**WITNESSETH**:

**WHEREAS**, City has taken appropriate proceedings to authorize construction of the public work and improvements herein provided for and to authorize execution of this Contract; and

**WHEREAS**, pursuant to State law and City requirements, a notice was duly published for bids for the contract for the improvement hereinafter described; and

**WHEREAS**, on _____, after notice duly given, the City Council of Burlingame awarded the contract for the construction of the improvements hereinafter described to Contractor, which the Council found to be the lowest responsive, responsible bidder for these improvements; and

**WHEREAS**, City and Contractor desire to enter into this Agreement for the construction of said improvements.

**NOW, THEREFORE, IT IS AGREED** by the parties hereto as follows:

1. Scope of work.

Contractor shall perform the work described in those Contract Documents entitled:

**WASHINGTON PARK PLAYGROUND, SPORTS COURT, & PICNIC AREA**

**CITY PROJECT 85670**

2. The Contract Documents.

The complete contract between City and Contractor consists of the following documents: this Agreement; Notice Inviting Sealed Bids, attached hereto as Exhibit A; the accepted Bid

Proposal, attached hereto as Exhibit B; the specifications, provisions, addenda, complete plans, profiles, and detailed drawings contained in the bid documents titled WASHINGTON PARK PLAYGROUND, SPORTS COURT, & PICNIC AREA, CITY PROJECT 85670 attached as Exhibit C; the State of California Standard Specifications 2010, as promulgated by the California Department of Transportation; prevailing wage rates of the State of California applicable to this project by State law; and all bonds; which are collectively hereinafter referred to as the Contract Documents. All rights and obligations of City and Contractor are fully set forth and described in the Contract Documents, which are hereby incorporated as if fully set forth herein. All of the above described documents are intended to cooperate so that any work called for in one, and not mentioned in the other, or vice versa, is to be executed the same as if mentioned in all said documents.

3. Contract Price.

The City shall pay, and the Contractor shall accept, in full, payment of the work above agreed to be done, the sum of _____ dollars ($_____), called the "Contract Price". This price is determined by the lump sum and unit prices contained in Contractor's Bid. In the event authorized work is performed or materials furnished in addition to those set forth in Contractor's Bid and the Specifications, such work and materials will be paid for at the unit prices therein contained. Said amount shall be paid in progress payments as provided in the Contract Documents.

4. Termination

At any time and with or without cause, the City may suspend the work or any portion of the work for a period of not more than 90 consecutive calendar days by notice in writing to Contractor that will fix the date on which work will be resumed. Contractor will be granted an adjustment to the Contract Price or an extension of the Time for Completion, or both, directly attributable to any such suspension if Contractor makes a claim therefor was provided in the Contract Documents.

The occurrence of any one or more of the following events will justify termination of the contract by the City for cause: (1) Contractor's persistent failure to perform the work in accordance with the Contract Documents; (2) Contractor's disregard of Laws or Regulations of any public body having jurisdiction; (3) Contractor's disregard of the authority of the Engineer; or (4) Contractor's violation in any substantial way of any provision of the Contract Documents. In the case of any one or more of these events, the City, after giving Contractor and Contractor's sureties seven calendar days written notice of the intent to terminate Contractor's services, may initiate termination procedures. Such termination will not affect any rights or remedies of City against

Contractor then existing or that accrue thereafter. Any retention or payment of moneys due Contractor will not release Contractor from liability. At the City's sole discretion, Contractor's services may not be terminated if Contractor begins, within seven calendar days of receipt of such notice of intent to terminate, to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 calendar days of such notice.

Upon seven calendar days written notice to Contractor, City may, without cause and without prejudice to any other right or remedy of City, terminate the Contract for City's convenience. In such case, Contractor will be paid for (1) work satisfactorily completed prior the effective date of such termination, (2) furnishing of labor, equipment, and materials in accordance with the Contract Documents in connection with uncompleted work, (3) reasonable expenses directly attributable to termination, and (4) fair and reasonable compensation for associated overhead and profit. No payment will be made on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

5. Provisions Cumulative.

The provisions of this Agreement are cumulative and in addition to and not in limitation of any other rights or remedies available to the City.

6. Notices.

All notices shall be in writing and delivered in person or transmitted by certified mail, postage prepaid.

Notices required to be given to the City shall be addressed as follows:

Karen Hager
Management Analyst
City of Burlingame
850 Burlingame Avenue
Burlingame, California 94010

Notices required to be given to Contractor shall be addressed as follows:

Name
Company Name
Address

7. Interpretation

As used herein, any gender includes the other gender and the singular includes the plural and vice versa.

DRAFT

8. Waiver or Amendment.

No modification, waiver, mutual termination, or amendment of this Agreement is effective unless made in writing and signed by the City and the Contractor. One or more waivers of any term, condition, or other provision of this Agreement by either party shall not be construed as a waiver of a subsequent breach of the same or any other provision.

9. Controlling Law.

This Agreement is to be governed by and interpreted in accordance with the laws of the State of California.

10. Successors and Assignees.

This Agreement is to be binding on the heirs, successors, and assigns of the parties hereto but may not be assigned by either party without first obtaining the written consent of the other party.

11. Severability.

If any term or provision of this Agreement is deemed invalid, void, or unenforceable by any court of lawful jurisdiction, the remaining terms and provisions of the Agreement shall not be affected thereby and shall remain in full force and effect.

12. Indemnification.

Contractor shall indemnify, defend, and hold the City, its directors, officers, employees, agents, and volunteers harmless from and against any and all liability, claims, suits, actions, damages, and causes of action arising out of, pertaining or relating to the actual or alleged negligence, recklessness or willful misconduct of Contractor, its employees, subcontractors, or agents, or on account of the performance or character of the services, except for any such claim arising out of the sole negligence or willful misconduct of the City, its officers, employees, agents, or volunteers. It is understood that the duty of Contractor to indemnify and hold harmless includes the duty to defend as set forth in section 2778 of the California Civil Code. Notwithstanding the foregoing, for any design professional services, the duty to defend and indemnify City shall be limited to that allowed by state law. Acceptance of insurance certificates and endorsements required under this Agreement does not relieve Contractor from liability under this indemnification and hold harmless clause. This indemnification and hold harmless clause shall apply whether or not such insurance policies shall have been determined to be applicable to any of such damages or claims for damages.

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**IN WITNESS WHEREOF**, two identical counterparts of this Agreement, consisting of five pages, including this page, each of which counterparts shall for all purposes be deemed an original of this Agreement, have been duly executed by the parties hereinabove named on the day and year first hereinabove written.

CITY OF BURLINGAME,
a Municipal Corporation

By _____
Lisa K. Goldman, City Manager

"CONTRACTOR"

By _____
Print Name:
Company Name:

Approved as to form:

_____
Kathleen Kane, City Attorney

ATTEST:

_____
Meaghan Hassel-Shearer, City Clerk

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# SUPPLEMENTARY GENERAL CONDITIONS
# WASHINGTON PARK PLAYGROUND, SPORTS COURT, & PICNIC AREA
# CITY PROJECT 85670

The General Conditions and Standard Conditions are hereby amended as follows:

1. Section 6.02 of the General Conditions is amended by adding the following:

   The City-furnished materials for this project that will be purchased by the City and Installed by the Contractor are:

   a. Site Drinking Fountains
   b. Park Benches
   c. Trash and Recycle Receptacles
   d. Bike Racks
   e. Picnic Tables
   f. Park Grills
   g. Heritage Tree

   The Contractor will provide the Project Manager with at least 48 hours notice to arrange for pick-up of the pre-purchased items at either 250 Anza Boulevard, Burlingame or 420 Carolan Avenue, Burlingame.

   The following items will be purchased and installed by others:
   a. Washington Park Playground Equipment & Installation will be installed under a separate contract with Ross Recreation. The Contractor will coordinate the schedule with Alex Hailey phone: 707.538.3800 or email: alexh@rossrec.com
   b. The turf surfacing will be installed by Robertson, Inc. The Contractor will coordinate the schedule with Shelly Vasquez email: Shelly.Vasquez@playcoresurfacing.com or phone 650-433-0655.

2. Section 8.04 of the General Conditions is amended by adding the following:

   "Contractor's failure to achieve substantial completion of the work described in the Contract Documents will cause the City to incur losses of types and in amounts which are impossible to compute and ascertain with certainty. The Contractor shall pay to the City of Burlingame liquidated damages in the amount of $1000 per day for each day and every calendar days' delay in finishing the work in excess of the number of days (120) referred to in these specifications. The amount may be assessed and recovered by the City as against Contractor and its Surety. Such liquidated damages are intended to represent estimated actual damages and are not intended as a penalty, and Contractor shall pay them to the City, without limiting City's any of the City's rights as provided in the Contract Documents."

3. The Contractor shall complete the project within 120 working days from the Notice to Proceed. Within the 120 working days, the Contractor shall coordinate and schedule for the installation of play equipment and play surfacing by a Contractor under separate contract with the City. Within the overall 120 working day schedule the Bidder shall include and account for:

    a. 15 working days for installation of playground equipment
    b. 10 working days for installation of playground surfacing.

4. Bidder's scope shall include preparation of sub-grade and placement of base grade for playground surfacing installation. See Details 5 & 6 / L4.0.

5. Disqualification of Bidders. – The City may disqualify a bidder and reject the bidder's bid for any one or more of the following causes:
    a. More than one proposal from an individual, firm, partnership, corporation, or combination thereof under the same or different names is received; all such proposals will not be considered.
    b. Evidence of collusion among bidders.
    c. Lack of competency as revealed by any financial statement, as may be required by the special provisions, or by experience or plant and equipment statements submitted.
    d. Lack of responsibility as shown by past work on any Public Works project for the City or any other public entity judged from the standpoint of workmanship and/or progress.
    e. Incomplete work on any Public Works project for the City or any other public entity which, in the judgment of the City, might hinder or prevent the bidder from promptly completing the Washington Park Playground, Sports Court, and Picnic Area Project.
    f. Being in arrears on any existing Public Works or Parks & Recreation contract for the City or any other public entity, in litigation with the City, or having defaulted on a previous contract with any public entity.
    g. Failure of the bidder to provide prices for all items in the proposal, including alternatives, or submitting an incomplete or otherwise non-responsive proposal.
    h. Any other ground which the Project Manager determines would significantly impair the ability of the bidder to perform the proposed work. In making this determination, the Project Manager may consider, without limitation, items such as any previous or current prevailing wage violations by the bidder, the number of stop notices on previous public works projects performed by the bidder, and the existence of past or current agreements with other public entities to not bid on public works projects.

*** END OF SECTION ***

# GEOTECHNICAL INVESTIGATION
# BURLINGAME COMMUNITY CENTER
# 850 BURLINGAME AVENUE
# BURLINGAME, CALIFORNIA

**THIS REPORT HAS BEEN PREPARED FOR:**

**CITY OF BURLINGAME**

**C/O GROUP 4 ARCHITECTURE**

**ATTN: TERESA ROM**

**ATTN: DAWN MERKES**

**ATTN: MIKI MORI**

**211 LINDEN AVENUE**

**SOUTH SAN FRANCISCO, CALIFORNIA 94080**

**JULY 2018**

MURRAY ENGINEERS INC
GEOTECHNICAL SERVICES

MURRAY ENGINEERS INC
GEOTECHNICAL SERVICES

July 23, 2018
Project No. 3053-1R1

**City of Burlingame**
c/o Group 4 Architecture
Attn: Teresa Rom
Attn: Dawn Merkes
Attn: Miki Mori
211 Linden Avenue
South San Francisco, CA 94080

**RE: GEOTECHNICAL INVESTIGATION, BURLINGAME COMMUNITY CENTER, 850 BURLINGAME AVENUE, BURLINGAME, CALIFORNIA**

Ladies and Gentlemen:

We are pleased to present the results of our geotechnical investigation relating to design and construction of the new community center on the property at 850 Burlingame Avenue in Burlingame, California. This report summarizes the results of our field, laboratory, and engineering work, and presents geotechnical recommendations for the design and construction of the project.

The conclusions and recommendations presented in this report are contingent upon our review of the project plans and our observation and testing of the geotechnical aspects of the construction.

If you have any questions concerning our investigation, please call.

Sincerely,
**MURRAY ENGINEERS, INC.**

REGISTERED PROFESSIONAL ENGINEER
JOHN A. STILLMAN
No. GE2523
Exp: 12/31/2018
STATE OF CALIFORNIA

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# GEOTECHNICAL INVESTIGATION
# BURLINGAME COMMUNITY CENTER
# 850 BURLINGAME AVENUE
# BURLINGAME, CALIFORNIA

## INTRODUCTION

This report presents the results of our geotechnical investigation relating to design and construction of the new community center at 850 Burlingame Avenue in Burlingame. The project location is indicated on Figure A-1, Vicinity Map. The purpose of our investigation was to explore the subsurface soil and geologic conditions on the site in the area of the proposed improvements and to provide geotechnical conclusions and recommendations relating to the foundation and earthwork components of the project.

### Project Description

The project will consist of demolition of the existing one-story recreational building and construction of a new approximately 35,000 square-foot two-story community center building. A below-grade parking garage is planned beneath a portion of the building. Site improvements will include relocation of the playground, basketball court, and parking lots. The approximate layout of the existing and planned improvements is shown on the Site Plan, Figure A-2.

### Scope of Services

We performed the following services in accordance with our agreement with you dated May 4, 2018 (executed June 11, 2018):

- Reviewed geologic and seismic conditions in the area and evaluated geologic hazards that could potentially impact the site and the proposed improvements
- Performed a reconnaissance of the site in the area of the proposed improvements
- Explored the site subsurface conditions by advancing and logging four cone penetration tests and two soil borings at the site
- Performed laboratory testing on selected soil samples for soil classification and to evaluate engineering properties of the subsurface materials
- Performed geotechnical engineering analyses to develop geotechnical engineering design criteria for the proposed improvements
- Prepared this report presenting a summary of our investigation and our geotechnical conclusions, recommendations, and design criteria associated with the proposed community center building

## GEOLOGIC & SEISMIC CONDITIONS

### Geologic Overview

The subject property is located along the western margin of the San Francisco Bay in the Santa Clara Valley, a broad, sediment-filled basin bounded on the southwest by the Santa Cruz Mountains and on the northeast by the Diablo Mountain range. According to the USGS topographic map of the San Mateo Quadrangle, which is reproduced in the Vicinity Map, Figure A-1, the site is situated at an approximate elevation of 25 feet above mean sea level.

Based on review of the Geologic Map of the Montara Mountain and San Mateo 7-1/2' Quadrangles (Pampeyan, 1993), the site is located in an area underlain by Holocene age (less than 11,000 years old) medium-grained alluvium (Qam) and Pleistocene age (approximately 10,000 to 2 million years old) older alluvium (Qoa). Medium-grained alluvium is generally described as unconsolidated to moderately consolidated, moderately sorted fine sand, silt, and clayey silt deposited at the edge of course-grained alluvial fans. Older alluvium is generally described as unconsolidated to moderately consolidated, gravel, sand and silt that grades coarser headward and interfingers with stream terrace deposits in narrow drainage channels. A copy of the relevant portion of this map is presented as the Vicinity Geologic Map, Figure A-3.

According to the State of California Seismic Hazard Zones Map for the San Mateo Quadrangle (California Geological Survey, 2018), the site is <u>not</u> located in an area potentially susceptible to earthquake-induced liquefaction. A copy of the relevant portion of this map is presented on the State Fault & Seismic Hazard Zones Map, Figure A-4.

### Seismicity

The San Francisco Bay Area, which is affected by the San Andreas fault system, is recognized by geologists and seismologists as one of the most active seismic regions in the United States. In the Bay Area there are four major faults trending in a northwest direction within the San Andreas fault system, which have generated about 12 earthquakes per century large enough to cause significant structural damage. These faults include the San Andreas, San Gregorio, Hayward, and Calaveras faults. The San Andreas fault is located approximately 3.0 miles southwest of the site. The San Gregorio fault is located approximately 10 miles southwest of the site. The Hayward and Calaveras faults are located approximately 15 and 24 miles northeast of the site, respectively.

Seismologic and geologic experts convened by the United States Geological Survey, California Geological Survey, and the Southern California Earthquake Center conclude that there is a 72 percent probability for at least one "large" earthquake of magnitude 6.7 or larger in the Bay Area before the year 2043. The northern portion of the San Andreas fault is

estimated to have a 6 percent probability of producing a magnitude 6.7 or larger earthquake by the year 2043 and the Hayward and Calaveras faults are estimated to have a 14 percent and 7 percent probability of producing a similar magnitude earthquake during the same time period (Working Group on California Earthquake Probabilities, 2014).

## SITE EXPLORATION & RECONNAISSANCE

### Exploration Program

An initial reconnaissance was performed by our senior staff engineer on April 9, 2018. Our subsurface exploration was performed on May 29 and 30, 2018 and included two soil borings to depths of approximately 50 feet and four cone penetration tests (CPTs) to depths of approximately 40 to 60 feet at the locations shown on Figure A-2, Site Plan. The boring and CPT locations were approximately determined by measuring distance from known points on a supplied site plan using a tape measure and should be considered accurate only to the degree implied by the mapping techniques used.

Our field geologist logged the borings in general accordance with the Unified Soil Classification System. The boring logs show our interpretation of the subsurface conditions at the location and on the date indicated and it is not warranted that these conditions are representative of the subsurface conditions at other locations and times. In addition, the stratification lines shown on the logs represent approximate boundaries between various soil materials and the transitions may be gradual. Soil samples recovered from the borings were retained for laboratory testing, classification, and for review by our senior staff engineer.

### Soil Borings

The exploratory borings were advanced using a truck-mounted drill rig equipped with hollow-stem augers. Soil samples were collected with split-spoon samplers that were driven with a 140-pound hammer repeatedly dropped from a height of 30 inches with a wire line sampling system. The split-spoon samplers used included 3-inch diameter (OD) California samplers, 2.5-inch OD Modified California samplers, and 2-inch OD Standard Penetration Test (SPT) samplers. The sampler types used are indicated on the logs at the appropriate depths. The number of hammer blows required to drive the samplers were recorded in 6-inch increments for the length of the 18-inch long sampler barrels. The associated blow count data, which is the sum of the second and third 6-inch increment, is presented on the boring logs as sampling resistance in blows per foot. The field blow counts for the 2.5-inch and 3-inch OD samplers have been adjusted to SPT blow counts for sampler diameter; however, the blow count data has not been adjusted for other factors such as hammer efficiency. The logs of our borings are presented in Appendix B as Figures B-1 and B-2. Also included in Appendix B is Figure B-3, Key to Boring Logs, and Figure B-4, Unified Soil Classification System.

**Cone Penetration Tests**

Cone penetration testing (CPT) is a subsurface exploration method (ASTM Test Method D-5778) whereby soil characteristics are measured using an integrated electronic piezocone penetrometer and data acquisition system hydraulically pushed into the ground. The cone device measures cone bearing ($q_c$), sleeve friction ($f_s$) and pore water pressure ($u_2$) at 2.5-centimeter intervals during penetration and correlates this information on a log in graphic form. The measurements were developed using a tip area of 15 $cm^2$ and a friction sleeve area of 225 $cm^2$ with a tip capacity of 1,500 bar, sleeve capacity of 15 bar, and a pore pressure capacity of 500 psi. The CPT penetrometers are designed with equal end friction sleeves, a net end area ratio of 0.8 and cone tips with a 60 degree apex angle. The penetrometer also contains porous polyethylene filter located directly behind the cone tip to measure of pore water pressure.

Soil classification and behavior type can be estimated from empirical relationships between $q_c$, $f_s$, and $u_2$. This information can also be used to develop friction ratio ($R_f$), which is the ratio of sleeve friction to the tip resistance expressed as a percentage. Generally, saturated cohesive soils have low tip resistance, high friction ratios and generate large excess pore water pressures and cohesionless soils have higher tip resistances, lower friction ratios, and do not generate significant pore water pressure. The normalized soil behavior type (SBT Qtn) (Robertson, 2009) was used to by correlating empirical relationships between $q_c$ and $R_f$. The logs of our CPTs are presented in Appendix C as Figures C-1 through C-4. Also included in Appendix C is Figure C-5, Key to Soil Behavior Types.

**Site Description**

The project site is located on the east corner of Washington Park in a developed residential area of Burlingame. Washington Park is currently developed with a park department building, a recreation building, baseball field, softball field, tennis courts, a basketball court, bocce courts, horseshoe pits, a playground, and several parking lots. The Gunst Estate at the north corner of the site consists of grass lawn and scattered mature trees transected by asphalt pathways.

The planned community center building site is currently occupied by the existing recreation building. The single-story recreation building is bounded by the Gunst Estate to the northwest, an asphalt parking lot to the northeast, a private asphalt drop-off loop to the southeast, and a playground to the southwest. The existing ground surface in the vicinity of the recreation building is relatively level with overall site drainage to the northeast.

**Subsurface**

Two borings and four CPTs were advanced at the site in the vicinity of the new community center building and underground parking garage. The locations of the borings and CPTs are shown on Figure A-2. In general, the borings and CPTs encountered alluvium consist of layers of very stiff to hard lean clay and dense to very dense clayey to silty sand to the maximum depth explored of 60 feet. The logs of the borings are presented in Appendix B and logs of the CPTs are presented in Appendix C.

**Groundwater**

Groundwater was encountered while drilling Borings B-1 and B-2 at depths of approximately 25.5 to 27 feet below existing site grades, respectively. Based on our interpretation of the CPT data, the assumed phreatic surfaces based on dynamic pore pressure response are approximately 12 to 17 feet below existing site grades at the time of our subsurface investigation. We note that fluctuations in the groundwater level can occur due to variations in rainfall, landscaping, and other factors that may not have been evident at the time our measurements were made.

**Laboratory Test Results**

Atterberg Limits established for a sample of the silty clay alluvium encountered in Boring B-2 at a depth of approximately 1 to 2.5 feet yielded a plasticity index of 10 percent and a liquid limit of 25 percent, indicating that this material has a low potential for expansion with increases in moisture content (see Figure D-1, Liquid & Plastic Limits Test Report).

A staged, consolidated-undrained triaxial compression test was performed by Cooper Testing Laboratory on one sample of alluvium. Triaxial testing of the clayey sand encountered in Boring B-1 at depths of 8.5 to 10 feet yielded an internal friction angle (phi) of 34 degrees and a cohesion value (C) of 400 pounds per square foot (see Figure D-2, Consolidated Undrained Triaxial Test Report).

Unconsolidated-undrained triaxial testing was also performed by Cooper Testing Laboratory on four samples of alluvium, the results of which are presented on Figure D-3, entitled "Unconsolidated-Undrained Triaxial Test Report".

**CONCLUSIONS**

In our opinion, the proposed site development is feasible from a geotechnical perspective provided that the recommendations contained in this report are implemented in the design and construction of the project. The primary constraints to the proposed improvements are the potential for encountering shallow groundwater within deeper excavations such as for

utility trenches and elevator pits and the potential for strong ground shaking at the site during a moderate to large earthquake on one of the nearby active faults.

Based on our investigation, the site appears to be underlain by predominantly very stiff to hard fine-grained and dense to very dense coarse-grained alluvial soils to the full depth explored of 60 feet. In our opinion, the underlying competent alluvial soil materials should provide adequate support for the foundations of the proposed building.

**Geologic Hazards**

We briefly reviewed the potential for geologic hazards to impact the site and the proposed improvements, considering the geologic setting, and the soils encountered during our investigation. The results of our review follow:

- Fault Rupture - Based on our review of published maps, it is our opinion that no active or potentially active faults cross the subject property. Therefore, in our opinion the potential for fault rupture to occur at the site is very low.

- Ground Shaking - As noted in the Seismicity section above, moderate to large earthquakes are probable along several active faults in the greater Bay Area. Therefore, strong ground shaking should be expected several times during the design life of the proposed improvements. The improvements should be designed in accordance with current earthquake resistant standards, including the 2016 CBC guidelines and design parameters presented in this report. It should be clearly understood that these guidelines and parameters will not prevent damage to structures; rather they are intended to prevent catastrophic collapse. The magnitude and extent of earthquake-related damage can be mitigated to a degree by utilizing an upgraded structural design. The project structural engineer should be consulted for additional details relating to an upgraded seismic design.

- Differential Compaction – During moderate and large earthquakes, soft or loose, natural or fill soils can densify and settle, often unevenly across a site. Because the alluvial soils encountered in our subsurface investigation is generally very stiff to hard and dense to very dense, in our opinion, the potential for differential compaction on the site is low provided the planned improvements are designed and constructed in accordance with the recommendations contained herein.

- Liquefaction – Liquefaction is a soil softening response, by which an increase in the excess pore water pressure results in partial to full loss of soil shear strength. Earthquake-induced liquefaction can occur in sand and silt because of liquefaction reconsolidation, and in clay due to cyclic strain softening. In order for liquefaction to occur, the following four factors are required: 1) saturated soil or soil situated below

the groundwater table; 2) undrained loading (strong ground shaking), such as by earthquake; 3) contractive soil response during shear loading, which is often the case for a soil which is initially in a loose or uncompacted state; and 4) susceptible soil type; such as clean, uniformly graded sands, non-plastic silts, or gravels. Structures situated above temporarily liquefied soils may sink or tilt, potentially resulting in significant structural damage. Cyclic softening describes liquefaction-like behavior in soft clays. Cyclic softening and strength loss of saturated clays during earthquakes is often an important consideration in engineering problems such as slope stability, dam/levee safety, and foundation bearing capacity. Because the site is underlain by predominantly very stiff to hard, cohesive, fine-grained and dense to very dense coarse-grained alluvial soils, it is our opinion that the potential for liquefaction and liquefaction-related distress to the proposed improvements is relatively low provided the planned improvements are designed and constructed in accordance with the recommendations contained herein. In addition, the site is mapped outside the area considered susceptible to earthquake-induced liquefaction (see Figure A-4).

**RECOMMENDATIONS**

We recommend that the proposed at-grade and below-grade garage beneath the community center building, its retaining walls, and any attached porch and roof overhangs be supported on reinforced concrete mat slab or spread footing foundations bearing in the underlying alluvium. In our opinion, a well reinforced mat foundation will generally have more capability of spanning local soil irregularities which will help to limit differential foundation movement. However, in our opinion an adequately design spread footing foundation will performed reasonable well for the planned structures but with a slightly higher risk of differential foundation settlement. This potential risk should be understood and accepted by the client, design team, and general contractor. In addition, to mitigate the potential for differential settlement, any mat or footing foundations planned adjacent to the basement retaining walls should be designed to span the area underlain by planned basement retaining wall backfill. Based on available groundwater data, unless the finished floor of the basement will extend below a depth of 10 feet, in our opinion, groundwater should not impact the basement design but the potential for some ground water entering into the basement excavation should be taken into account by the building contractor. In addition, there is a potential for encountering isolated zones of relatively clean granular deposits of variable density and consistency during excavations for the proposed basement structure. As a result, in our opinion the foundation and earthwork contractors should be cautioned that vertical and near vertical cuts in the more granular materials may be prone to raveling and potentially more significant caving failure. The building contractor should take appropriate precautions to shore the proposed basement excavation, as necessary. The design and construction of any temporary shoring or dewatering is the responsibility of the building contractor and is beyond the scope of this investigation. We strongly encourage the use of a waterproofing

consultant and/or waterproofing subcontractor if there is a concern with moisture intrusion into the below-grade parking area.

Based on our findings, we anticipate groundwater may vary and be as shallow as approximately 10 feet beneath the site. Proposed deeper foundations such as for elevator pit or utility trench excavations may encounter soft saturated soil conditions if excavated near or within this depth range. Dewatering and/or local ground improvement methods may be required to mitigate this concern.

Landscape features such as site walls, enclosures, sign or light posts, fences, gates, and other similar structures may also be supported on spread footings. Concrete slabs-on-grade and flexible pavements should be supported over a section of select granular fill to mitigate the potential for expansive soil movement. Detailed foundation, grading, and drainage recommendations and design criteria are presented in the following sections of this report. We should review the proposed layout and design, prior to completion of the final plans, to verify that the following recommendations are appropriate and have been properly interpreted and incorporated into the plans.

## 2016 CBC EARTHQUAKE DESIGN PARAMETERS

We have developed site-specific earthquake design parameters based on the procedures described in Chapter 16, Section 1613 of the 2016 California Building Code (California Building Standards Commission, 2016). These procedures utilize State standardized spectral acceleration values for maximum considered earthquake ground motion taking into account historical seismicity, available paleoseismic data, and activity rates along known fault traces, as well as site-specified soil and bedrock response characteristics. Contour maps of Class B bedrock horizontal spectral acceleration values for the State of California are included as figures in Chapter 16 of the 2016 CBC, representing both short (0.2 seconds) and long (1.0 second) periods of spectral response and taking into account 5 percent of critical damping. The United States Geological Survey (2018) has prepared an online seismic design value application tool that allows for site-specific adjustments of these acceleration values for different subsurface conditions, which are defined by site classes. Given representative latitude of 37.58195 and longitude of -122.34282 in accordance with guidelines presented in the 2016 CBC, the following seismic design parameters will apply for this site:

- Site Class D – Soil Profile Name: Stiff Soil
- Mapped Spectral Accelerations for 0.2 second Period: $S_S$= 1.996 g (Site Class B)
- Mapped Spectral Accelerations for a 1-second Period: $S_1$= 0.939 g (Site Class B)
- Design Spectral Accelerations for 0.2 second Period: $S_{DS}$= 1.331 g (Site Class D)
- Design Spectral Accelerations for a 1-second Period: $S_{D1}$= 0.939 g (Site Class D)

## FOUNDATIONS

### Mat Slabs

The proposed community center building and underground parking garage may be supported on a reinforced concrete mat slab foundation bearing in the underlying alluvium. The mat may be designed for an average maximum allowable bearing pressure of 2,000 pounds per square foot (psf) for combined dead plus live loads, with a one-third increase allowed for transient loads, including wind or seismic forces. In our opinion, the maximum average allowable bearing pressure recommended above may be exceeded locally for column loads up to a maximum allowable bearing capacity of 2,500 psf

If the structural engineer will utilize a modulus of subgrade reaction in the mat design, we estimate that the modulus of vertical subgrade reaction for a 1-foot square plate for the soil profile beneath the mat to be approximately 65 pounds per cubic inch (pci) based on engineering judgement and Terzaghi's method as presented on Figure 6 in Chapter 5 of the Navy Design Manual, (NAVFAC DM 7.1) (Department of the Navy, 1982a). For the proposed mat foundation measuring 80 by 100 feet, we estimate that the modulus of vertical subgrade reaction in the center of the mat to be a maximum 15 pci based on engineering judgment and utilizing in part the Navy Design Manual (NAVFAC DM 7.2) and Canadian Foundation Engineering Manual, 3th edition. We caution that the structural engineer should consider the dimensions of the loaded area and the various column and line loading/spacing in evaluating the modulus of subgrade reaction in accordance with the guidance presented in the Navy Design Manual (NAVFAC DM 7.2) (Department of the Navy, 1982b), Section 9.6 of Foundation Analysis and Design (Bowles, 1996), or in accordance with some other suitable reference.

Lateral loads may be resisted by friction between the mat and the supporting subgrade utilizing an allowable frictional resistance of 0.30 for concrete formed on the alluvial deposits. Once a waterproofing system has been selected, we should review the proposed plans to verify that the above frictional resistance is appropriate. In addition, lateral resistance may be provided by passive pressures acting against the lower two-thirds of the basement retaining walls using an allowable equivalent fluid pressure of 300 pounds per cubic foot. The mat foundation should be reinforced with a grid of steel reinforcing bars. Actual mat slab thickness and reinforcing should be determined by the project structural design engineer based on the preceding recommendations, anticipated loading, and other structural requirements.

We recommend that the basement mat foundation be provided with a subdrain system integrally designed with the basement retaining wall drainage. Figures A-5 and A-6 present schematic details for alternative subdrain systems for basement retaining walls and mat foundations. We recommend that the mat slab be underlain by a minimum of 8 inches of

½- to ¾-inch clean crushed rock underlain by filter fabric. To facilitate drainage below the slab, the subgrade soil beneath the mat should be sloped at an inclination of approximately 1.5 percent to a perimeter trench where the retaining wall drainage pipe will be located. Please also refer to the Retaining Wall Drainage section of this report.

Our representative should observe the basement excavation upon its completion and prior to placement of the slab subdrainage system to evaluate the condition of the subgrade material and to make sure that the conditions are consistent with those anticipated from our borings. It may be necessary to compact the subgrade material in the basement excavation, if loose or disturbed areas are created or encountered during construction.

We estimate post-construction thirty-year differential foundation movement due to static loads on the order of approximately ¾-inch across any 20-foot horizontal span of the mat-supported improvements.

**Spread Footings**

The proposed community center building and underground parking garage may be supported on spread footings bearing in the underlying alluvial soil. Continuous spread footings should have a minimum width of 18 inches and isolated spread footings should be a minimum of 24 inches square. Spread footings should extend at least 30 inches deep below final adjacent exterior grade and 24 inches deep below bottom of slab subgrade. Footings supporting less-critical at-grade landscape improvements detached from the building, such as site walls, sign or light posts, fences, and gates, may extend a minimum of 18 inches below lowest adjacent grade with the understanding that some degree of differential movement may occur from expansive soil movement. If soft or loose soils are encountered in the footing excavations, the bases of the footing excavations should be compacted using equipment such as a jumping jack compactor prior to the placement of steel and concrete.

We recommend that the footings be designed using an allowable bearing pressure of 2,000 pounds per square foot (psf) for dead plus live loads, with a one-third increase allowed for total loads, including wind and seismic forces. The weight of the footing portion extending below grade may be neglected for design purposes.

Lateral loads may be resisted by friction between the bottom of the footings and the supportive material using an allowable friction coefficient of 0.30 for concrete formed on undisturbed soil or engineered fill. In addition to the preceding frictional resistance, lateral resistance may be provided by passive pressures acting against foundations poured neat in the footing excavations using an allowable equivalent fluid pressure of 300 pounds per cubic foot acting below a depth of 1 foot from the lowest adjacent grade.

Footings located adjacent to utility trenches or other footings should bear below a 1:1 plane extended upward from the bottom edge of the utility trench or footing. The footing excavations should be substantially free of all loose soil prior to placing reinforcing steel and concrete. Our representative should observe the footing excavations prior to placing concrete forms and reinforcing steel to evaluate that they are founded in competent bearing materials and have been properly cleaned. If soft or loose soils are encountered, it may be necessary to compact the bases of footing excavations using equipment such as a jumping jack compactor prior to placement of steel and concrete. In addition, any loose soil in the footing excavations resulting from the placement of forms and reinforcing steel should be removed prior to placing concrete.

We estimate post-construction thirty-year differential foundation movement due to static loads on the order of approximately 1-inch across any 20-foot horizontal span of the footing-supported improvements.

## BASEMENT RETAINING WALLS

Retaining walls will be utilized for the basement of the proposed building. Retaining walls should be supported on foundations designed in accordance with the recommendations provided above. Waterproofing or damp-proofing of retaining walls should be included in areas where wall moisture would be undesirable, such as at living space or where wall finishes could be impacted by moisture. The project architect or a waterproofing consultant should provide detailed recommendations for waterproofing or damp proofing, as necessary.

### Lateral Earth Pressures

Retaining walls should be designed to resist lateral earth pressure from the adjoining natural soils, backfill, seismic, and surcharge loads. Assuming that the backfill behind the walls will be level (e.g., not sloping upward) and that adequate drainage will be incorporated as recommended below, we recommend that walls restrained from movement at the top be designed to resist an equivalent fluid pressure of 45 pounds per cubic foot (pcf) plus a uniform lateral pressure of 8H pounds per square foot (psf), where H is the height of the retained soil in feet. Restrained walls should also be designed to resist an additional uniform pressure equal to one-half of any surcharge loads applied at the surface. Any unrestrained retaining walls with level backfill and adequate drainage should be designed to resist an equivalent fluid pressure of 45 pcf plus one-third of any surcharge loads.

In accordance with the 2016 CBC, where applicable, retaining walls should also be designed to resist lateral earth pressure from seismic loading. We recommend that the seismic loading be based on an equivalent fluid pressure for an unrestrained condition and a uniform pressure of 8H pounds per square foot (psf)/foot of wall height, where H is the height in feet of the retained soil. In our opinion, site retaining walls less than 6 feet high do not need

to be designed for seismic loading. The allowable passive pressures provided for retaining wall foundations may be increased by one-third for short-term seismic forces.

**Retaining Wall Drainage**

We recommend that retaining walls include a subsurface drainage system to mitigate the buildup of water pressure from surface water infiltration and other possible sources of water.

Retaining wall backdrains should consist of a minimum 4-inch diameter, perforated rigid pipe, Schedule 40 or SDR 35 (or equivalent) with the perforations facing down, resting on a 2- to 3-inch thick layer of crushed rock. The perforated pipe should be placed within a minimum 8-inch deep by 12-inch wide trench excavated below basement subgrade elevation at the perimeter of the basement walls. Subdrain pipes should be bedded and backfilled with ½- to ¾-inch clean crushed rock separated from the native soil with a geotextile filter fabric, such as TC Mirafi 140N or equivalent. The crushed rock backfill should extend vertically to within approximately 18 inches of the finished grade and laterally at least approximately 12 inches from the rear face of the wall. The crushed rock should be compacted with a jumping jack or vibratory plate compactor in lifts not exceeding roughly 12 inches in loose thickness. The upper roughly 18 inches of backfill should consist of native soil, which should be compacted in accordance with the Compaction section of this report to mitigate infiltration of surface water into the subdrain systems. The preceding recommendations are presented schematically for a mat foundation on Figure A-5, Basement Subdrain System Alternative A and for a footing foundation on Figure A-7, Basement Subdrain System Alternative C.

As an alternative to crushed rock, Miradrain, Enkadrain, or other geosynthetic drainage panels approved by this office may be used for retaining wall drainage. If used, the drainage panels should extend from a depth of approximately 18 inches below finish grade to the base of the retaining wall. An approximate 2-foot section of crushed rock wrapped in filter fabric should be placed around the drainpipe, as discussed previously. Geosynthetic drainage panels should be installed in strict compliance with manufacturer's recommendations with filter fabric against the crushed rock and soil backfill. The preceding recommendations are presented schematically for a mat foundation on Figure A-6, Basement Subdrain System Alternative B and for a footing foundation on Figure A-8, Basement Subdrain System Alternative D.

The subdrain trench and pipes should be sloped at a minimum of approximately 1.5 percent and should be connected to rigid, solid (non-perforated) discharge pipes to convey any collected water to a suitable discharge location away from the walls. The subdrain pipes for retaining walls should be provided with clean-out risers at their up-gradient ends and at most sharp directional changes to facilitate maintenance. The retaining wall subdrain system

should be kept completely separate from the surface drainage system and downspouts. Clean-out risers should be terminated below grade in a Christy box and should be clearly marked as subdrains to reduce the risk that cleanout pipes might be inadvertently used as discharge pipes for surface drains or downspouts.

**Backfill**

Backfill placed behind the walls should be compacted in accordance with the specifications outlined in Table 2 of the Compaction section of this report using light compaction equipment. If heavy compaction equipment is used, the walls should be temporarily braced. Please refer also to the Earthwork section of this report for important recommendations regarding wall backfill.

## SLABS-ON-GRADE

We anticipate concrete slabs-on-grade may be used for interior building floors (in conjunction with spread footing foundations), below-grade parking garage, driveways, parking lots, patios and miscellaneous walkways. We recommend that slabs-on-grade for interior building floors, below-grade parking garage, and driveways be underlain by at least 12 inches of select granular fill, such as Class 2 aggregate baserock, compacted in accordance with the recommendations provided in the Compaction section of this report. Slabs-on-grade for patios and walkways should be underlain by at least 8 inches of select granular fill. Any slabs-on-grade planned adjacent to the basement walls should be designed to span the area underlain by the planned basement retaining wall backfill to mitigate the concerns for backfill settlement. Where existing fill is present within areas of new hardscape, portions or all of the fill should be removed and replaced as engineered fill as deemed necessary by our field representative during construction. The preceding recommendations are intended to mitigate the potential for significant slab movement and cracking. We note that minor slab movement or localized cracking of slabs may still occur which could affect the serviceability of these slabs over time.

Prior to placement of the select granular fill, the subgrade soils should be scarified and moisture conditioned, as necessary, to a depth of approximately 6 inches and recompacted in accordance with the Compaction section of this report.

In general, exterior slabs-on-grade should be designed as "free-floating" slabs, structurally isolated from adjacent foundations. Slabs should be provided with control joints at spacing of not more than about 10 feet. The project structural engineer should determine slab reinforcing based on anticipated use and loading.

Select granular fill should be compacted in accordance with the Compaction section of this report. Where slab surface moisture would be a significant concern, such as interior floors,

we recommend that the slabs be underlain by a vapor retarder consisting of a highly durable membrane not less than 15 mils thick (such as Stego Wrap Vapor Barrier by Stego Industries, LLC or equivalent), underlain by a capillary break consisting of 4 inches of ½- to ¾-inch crushed rock. The capillary break may be considered the equivalent thickness as the upper 4 inches of select granular fill recommended above. Please also refer to the Vapor Retarder Considerations section below for additional information. Please note that these recommendations do not comprise a specification for "waterproofing." For greater protection against concrete dampness, we recommend that a waterproofing consultant be retained.

**Vapor Retarder Considerations**

Based on our understanding, two opposing schools of thought currently prevail concerning protection of the vapor retarder during construction. Some believe that 2 inches of sand should be placed above the vapor retarder to protect it from damage during construction and also to provide a small reservoir of moisture (when slightly wetted just prior to concrete placement) to benefit the concrete curing process. Still others believe that protection of the vapor barrier and/or curing of concrete are not as critical design considerations when compared to the possibility of entrapment of moisture in the sand above the vapor barrier and below the slab. The presence of moisture in the sand could lead to post-construction absorption of the trapped moisture through the slab and result in mold or mildew forming at the upper surface of the slab.

We understand that recent trends are to use a highly durable membrane (at least 15 mils thick) without the protective sand covering for interior slabs surfaced with floor coverings including, but not limited to, carpet, wood, or glued tiles and linoleum. However, it is also noted that several special considerations are required to reduce the potential for concrete edge curling if sand will not be used, including slightly higher placement of reinforcement steel and a water-cement ratio not exceeding 0.5 (Holland and Walker, 1998). We recommend that you consult with other members of your design team, such as your structural engineer, architect, and waterproofing consultant for further guidance on this matter.

## FLEXIBLE PAVEMENTS

### Asphaltic Concrete

Based on our subsurface findings, we anticipate that clay-rich soils will be encountered at the majority of subgrade level for the planned driveways and parking lots. Therefore, for designed purposes we have estimated an R-value of 10 for the near surface subgrade soil conditions. Based on our evaluation, in our opinion, parking and automobile traffic areas may utilize pavement sections that include 8 inches of Class 2 aggregate baserock, overlain by 2.5 inches of asphaltic concrete. In our opinion, this section should be capable of servicing conventional parking and automobile traffic areas generally associated with traffic indices of up to approximately 4.5. In our opinion, the placement of the above thickness of select granular fill beneath proposed asphalt will substantially mitigate but not eliminate the potential for differential movement of these pavements.

Where existing fill is present within areas of new pavement, the fill should be removed and replaced as engineered fill as deemed necessary by our field representative during construction. Prior to placement of the baserock, the subgrade soils should be scarified and moisture conditioned, as necessary, to a depth of approximately 6 inches and recompacted in accordance with the Compaction section of this report.

If a specific traffic index is desired, the following recommendations may be utilized in selecting the pavement section. Procedure 608 of the Caltrans Highway Design Manual was used to develop the pavement sections presented in Table 1, below. The analysis used to develop the table utilized an R-value of 10 for generally clay-rich subgrade soil and an assumed R-value of 78 for the baserock. These values were developed in accordance with Procedure 608 of the Caltrans Highway Design Manual. Asphaltic concrete and aggregate base should conform to and be placed in accordance with the requirements of the California Department of Transportation, Standard Specifications, latest edition, except that the compaction standard should be ASTM D 1557 (latest edition). We note that pavement design involves an understanding of the total vehicular loading that a pavement will experience over a 20-year life, and these loads are typically estimated based on the traffic volume anticipated and the weight of an anticipated vehicle – the heavier the load, the more damage incurred on a pavement. Therefore, it is common to use truck traffic as the controlling factor in design. In particular, the use of a 5.5 Traffic Index (or higher) for this heavy use type pavement improvement project is typical for the occasional heavy truck loads, such as garbage or fire trucks.

**Table 1. Asphaltic Concrete Pavement Sections**
**Assumed R-Value = 10**

| Design Traffic* Index | Asphaltic Concrete (Inches) | Aggregate Baserock (Inches) | Total Section Thickness (Inches) |
|---|---|---|---|
| 4.0 | 2.5 | 7.0 | 9.5 |
| | 3.0 | 6.0 | 9.0 |
| 4.5 | 2.5 | 8.0 | 10.5 |
| | 3.0 | 7.0 | 10.0 |
| 5.0 | 2.5 | 10.0 | 12.5 |
| | 3.0 | 9.0 | 12.0 |
| 5.5 | 3.0 | 11.0 | 14.0 |
| | 3.5 | 10.0 | 13.5 |
| 6.0 | 3.0 | 13.0 | 16.0 |
| | 3.5 | 11.0 | 14.5 |
| | 4.0 | 10.0 | 14.0 |
| 6.5 | 3.0 | 15.0 | 18.0 |
| | 3.5 | 14.0 | 17.5 |
| | 4.0 | 13.0 | 14.0 |

* The design traffic index should be determined by the pavement designer based on anticipated use and vehicular loading.

We also note that the Caltrans method of pavement design does not take into account the potential effects of heave from expansive soils. If broad areas of soft soils soil are encountered over the parking area subgrade, we suggest that consideration be given to incorporating a minimum baserock thickness of 12 inches and/or utilize a stabilizing geotextile to help bridge over weak areas beneath the asphalt surface. A representative from our office should observe the subgrade prior to placing baserock and should observe and test the compaction of the baserock during the course of construction.

In general, in our opinion the thinner the sections of AC and AB utilized in the pavement construction, the higher the potential for differential movement of the pavement surface imposed by variations in subsurface strength and expansion characteristics.

Exterior curbs and gutters along asphalt pavement perimeters should be underlain by at least 6 inches of select granular fill placed on a compacted subgrade surface. In general, concrete curbs and gutters should be provided with control joints spaced not more than approximately 10 feet. The project structural or civil engineer should determine reinforcement based on anticipated use and loading. Please refer to the Compaction section of this report for compaction specifications.

### Sand-Set Pavers

We anticipate that sand-set pavers or flagstones may be used for exterior hardscape. We generally recommend that they be placed in accordance with the manufacturer's recommendations. At a minimum, we also generally recommend that pavers be underlain by at least 12 inches of compacted Class 2 aggregate baserock for vehicular loads and at least 8 inches of compacted Class 2 aggregate baserock for pedestrian loads. In our opinion, the placement of the above thickness of select granular fill beneath proposed pavers or flagstones will substantially mitigate but not eliminate the potential for differential movement of these pavements. A representative from our office should observe the subgrade conditions of the hardscape prior to placement of baserock. The subgrade soils should be scarified and moisture conditioned as necessary, and compacted in accordance with the Compaction section of this report.

## EARTHWORK

A moderate amount of earthwork is anticipated as part of the proposed construction, including site and building pad grading, foundation excavations, subgrade preparation beneath mat slabs and exterior hardscape, retaining wall backfill, placement and compaction of engineered fill, and installation of site drainage. Earthwork should be performed in accordance with the following recommendations.

### Clearing & Site Preparation

Initially, the proposed building areas should be cleared of obstructions not designated to remain. Holes or depressions resulting from the removal of underground obstructions below proposed subgrade levels, such as the existing footings, and root balls, should be backfilled with engineered fill, placed and compacted in accordance with the recommendations provided below. After clearing, the proposed improvement areas should be adequately stripped to remove surface vegetation and organic-laden topsoil. The stripped material should not be used as engineered fill; however, it may be stockpiled and used for landscaping purposes.

### Material for Fill

On-site soils below the stripped layer having an organic content of less than 3 percent organic material by volume (ASTM D 2974) may be suitable for use as engineered fill contingent upon review by our firm. In general, fill material should not contain rocks or pieces larger than 6 inches in greatest dimension, and should contain no more than 15 percent larger than 2.5 inches. Any required imported fill should be predominantly granular material or low plasticity material with a plasticity index of less than approximately 15 percent. Any proposed fill for import should be approved by Murray Engineers, Inc. prior to importing to the site. Our approval process may require index testing to evaluate the

expansive potential of the soil; therefore, it is important that we receive samples of any proposed import material at least 3 days prior to importing. Class 2 aggregate baserock should meet the specifications outlined in the Caltrans Standard Specifications, latest edition.

**Compaction**

Prior to placing engineered fill, the subgrade soil should be scarified and compacted, as necessary. Material used for fill should be placed in uniform lifts, no more than 8 inches in uncompacted thickness. The fill material should be moisture conditioned, as necessary, and compacted in accordance with the specifications listed in Table 2 below. The relative compaction and moisture content specified in Table 2 are relative to ASTM D 1557, latest edition. Compacted lifts should be firm and non-yielding under the weight of compaction equipment prior to the placement of successive lifts.

**Table 2. Compaction Specifications**

| Fill Element | Relative Compaction* | Moisture Content* |
|---|---|---|
| General fill for raising of site grades, driveway, patio areas, and retaining wall backfill (for fills up to 4 feet thick) | 90 percent | Near optimum |
| For fills greater than 4 feet thick | 93 percent (entire fill) | Near optimum |
| Upper 6 inches of relatively non-expansive subgrade beneath hardscape | 90 percent | Near optimum |
| Aggregate baserock under hardscape | 95 percent | Near optimum |
| ½- to ¾-inch Crushed Rock - Compact with at least 3 passes of a vibratory plate with lift-thickness ≤ 12 inches. | see note at left | Not Critical |
| Backfill of utility trenches using on-site low plasticity soil | 90 percent | Near Optimum |
| Backfill of utility trenches using imported sand | 90 percent | Near Optimum |

*Relative to ASTM D 1557 (latest edition)

**Temporary Slopes & Trench Excavations**

The contractor should be responsible for the stability of all temporary cut slopes and trenches excavated at the site, and design and construction of any required shoring, dewatering, including temporary support of adjacent neighboring foundations. Shoring and bracing should be provided in accordance with all applicable local and state safety regulations, including the current OSHA excavation and trench safety standards. Because of the potential for variable soil conditions, field modifications of temporary cut slopes may be required. Unstable materials encountered on the slopes during the excavation should be trimmed off, even if this requires cutting the slope back at flatter inclinations. Murray Engineers, Inc. does not provide shoring design services.

## SITE DRAINAGE

Roof run-off, rain, or irrigation water should not be allowed to pond near the planned building, exterior hardscapes, or pavement areas. The building should be provided with a roof drainage system. Water collected in the roof drainage system should not be allowed to discharge freely onto the ground surface adjacent to the foundations and should be conveyed away from the building via splash blocks or via buried closed conduits and routed to a suitable discharge outlet. The finished grades should be designed to drain surface water away from the proposed building, slabs, pavement areas, and landscape areas to suitable discharge points. The ground surface should have positive gradient away from the structures. Where such surface gradients are difficult to achieve, we recommend that area drains or surface drainage swales be installed to collect surface water and convey it to a suitable discharge location away from the building.

We recommend that annual maintenance of the surface drainage systems be performed. This maintenance should include inspection and testing to make sure that the roof drainage system is in good working order and do not leak; inspection and flushing of area drains to make sure that they are free of debris and are in good working order; and inspection of surface drainage outfall locations to verify that introduced water flows freely through the discharge pipes and that no excessive erosion has occurred. If erosion is detected, this office should be contacted to evaluate its extent and to provide mitigation.

## REQUIRED FUTURE SERVICES

### Plan Review

To better assure conformance of the final design documents with the recommendations contained in this report, and to better comply with the building department's requirements, Murray Engineers, Inc. must review the completed project plans prior to construction. The plans should be made available for our review as soon as possible after completion so that we can better assist in keeping your project schedule on track. We recommend that the following note be added to the architectural, structural, and civil plans:

- The geotechnical aspects of the project, including site and building pad grading, foundation excavations, subgrade preparation beneath mat slabs and exterior hardscape, retaining wall backdrains and backfill, placement and compaction of engineered fill, and installation of site drainage should be performed in accordance with the recommendations of the geotechnical report prepared by Murray Engineers, Inc., dated July 23, 2018. Murray Engineers, Inc. should be provided at least 48 hours advance notification (650-559-9980) of any geotechnical aspects of the construction and should be present to observe and test the earthwork, foundation, and drainage installation phases of the project.

**Construction Observation Services**

Murray Engineers, Inc. should observe and test (as necessary) the earthwork and foundation phases of construction in order to a) confirm that subsurface conditions exposed during construction are substantially the same as those interpolated from our limited subsurface exploration, on which the analysis and design were based; b) evaluate compliance with the geotechnical design concepts, specifications, and recommendations; and c) allow design changes in the event that subsurface conditions differ from those anticipated. The recommendations in this report are based on limited subsurface information. The nature and extent of variation across the site may not become evident until construction. If variations are exposed during construction, it may be necessary to re-evaluate our recommendations.

**LIMITATIONS**

This report has been prepared for the City of Burlingame, specifically for developing geotechnical design criteria relating to design and construction of the new community center, as described above, at 850 Burlingame Avenue in Burlingame, California. In the event that any changes in the nature or locations of the proposed improvements are planned, the conclusions and recommendations of this report shall not be considered valid unless such changes are reviewed, and the conclusions and recommendations presented in this report are modified or verified in writing by this firm.

The opinions presented in this report are based upon information obtained from two soil borings and four cone penetration tests at widely separated locations, site reconnaissance, and upon local experience and engineering judgment, and have been formulated in accordance with generally accepted geotechnical engineering practices that exist in the San Francisco Bay Area at the time this report was prepared. Further, our recommendations are based on the assumption that soil and geologic conditions at or between the borings and CPTs do not deviate substantially from those encountered. In addition, geotechnical issues may arise during the course of construction that were not apparent at the time this report was prepared. No warranty, expressed or implied, is made or should be inferred. In addition, we are not responsible for data presented by others.

The recommendations provided in this report are based on the assumption that we will be retained to provide the Future Services described above in order to evaluate compliance with our recommendations. If we are not retained for these services, Murray Engineers, Inc. cannot assume any responsibility for any potential claims that may arise during or after construction, as a result of misuse or misinterpretation of Murray Engineers, Inc.'s report by others. Furthermore, if another geotechnical consultant is retained for follow-up service to this report, Murray Engineers, Inc. will at that time cease to be the Engineer-of-Record.

The opinions presented in this report are valid as of the present date for the property evaluated. Changes in the condition of a property can occur with the passage of time, whether due to natural processes or the works of man, on this or adjacent properties. In addition, changes in applicable standards of practice can occur, whether from legislation or the broadening of knowledge. Accordingly, the opinions presented in this report may be invalidated, wholly or partially, by changes outside of our control. Therefore, this report is subject to review and should not be relied upon after a period of three years. In addition, this report should not be used and is not applicable for any property other than that evaluated.

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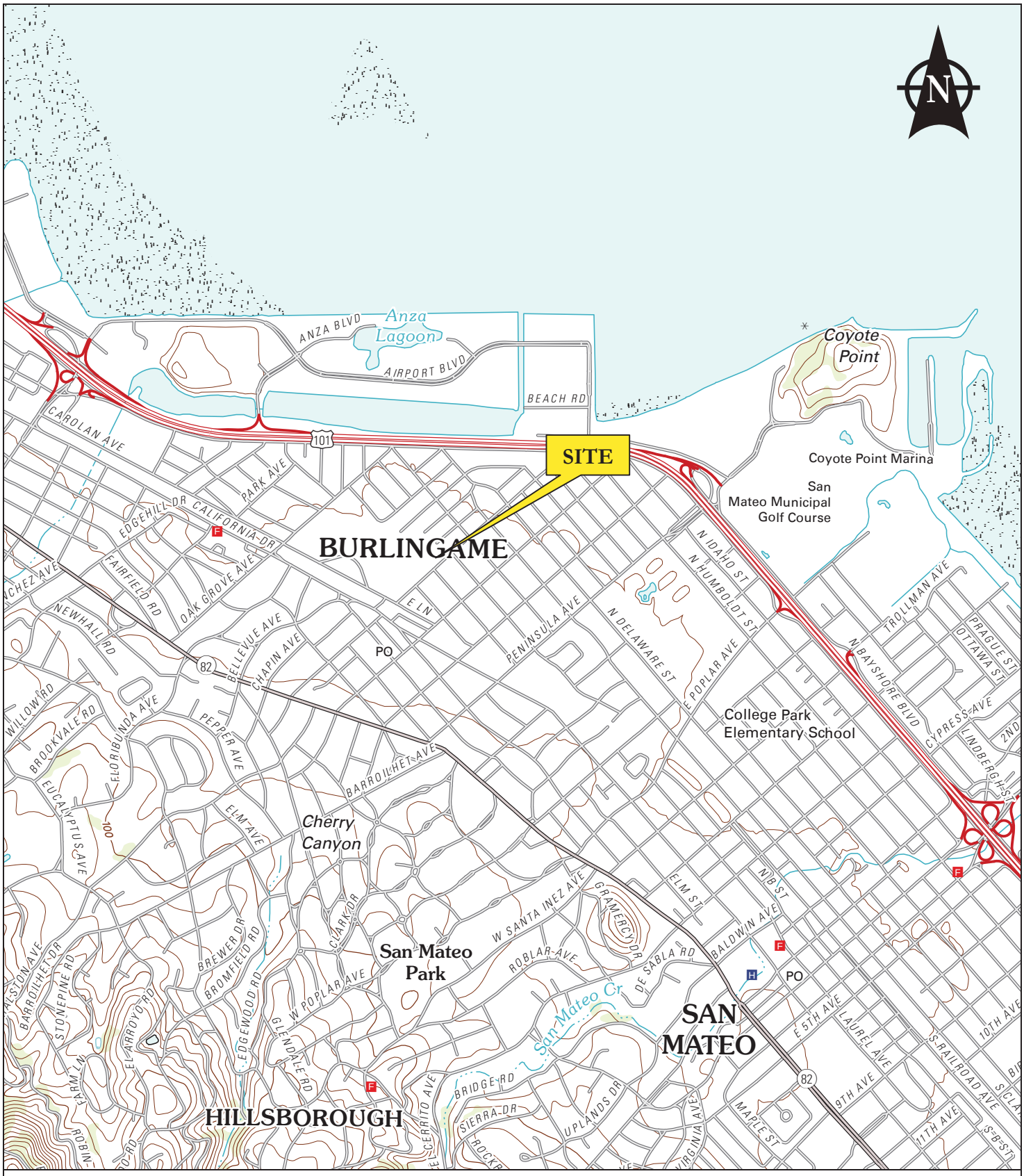
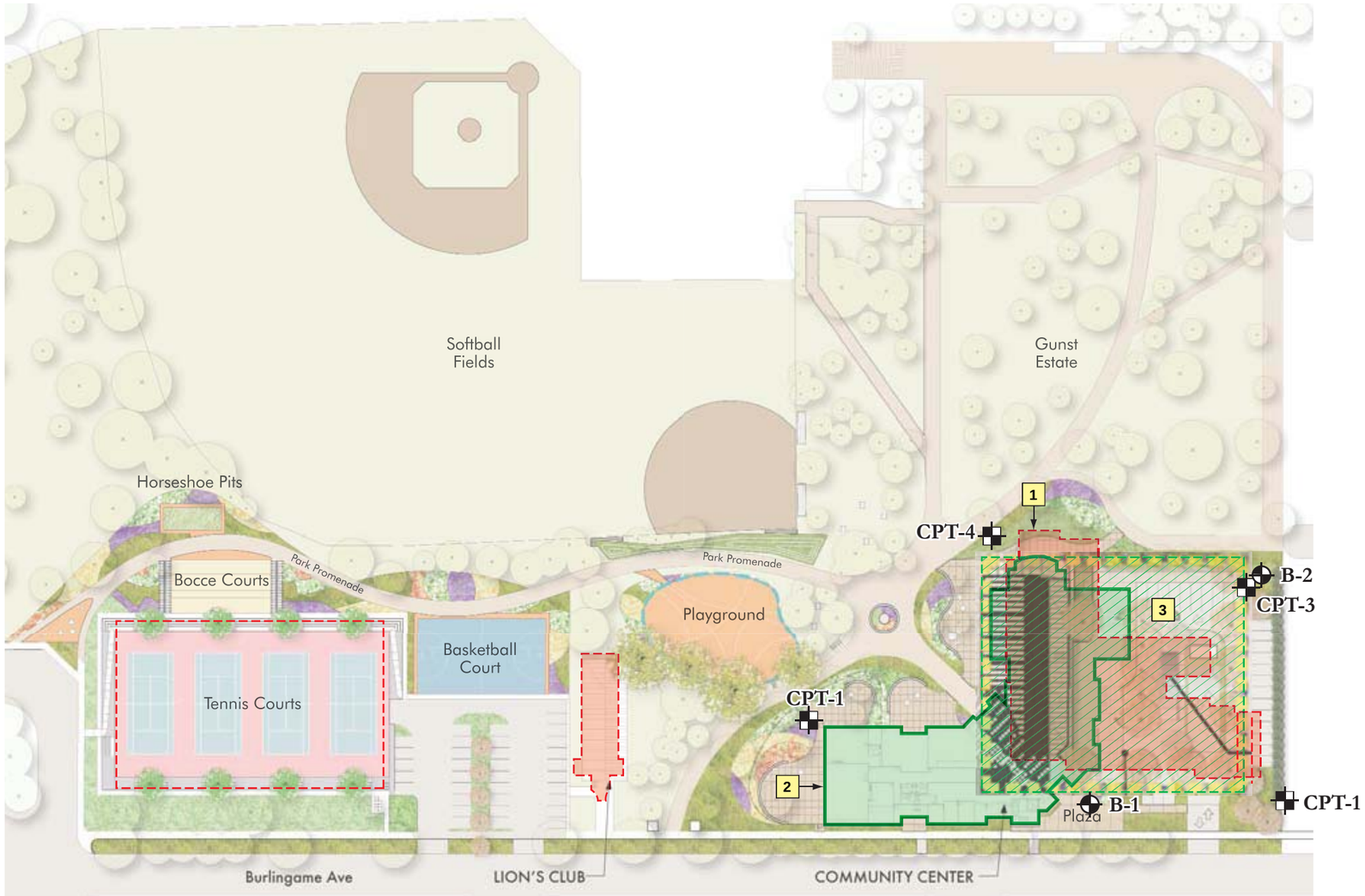



Base: USGS San Mateo Quadrangle, 7.5 Minute Series (Topographic), 2012 Scale: 1 inch = 2,000 feet

| | | |
|---|---|---|
| MURRAY ENGINEERS INC GEOTECHNICAL SERVICES | BURLINGAME COMMUNITY CENTER<br>850 BURLINGAME AVENUE<br>BURLINGAME, CALIFORNIA | VICINITY MAP |
| | PROJECT NO. 3053-1R1 / JULY 2018 | FIGURE A-1 |




## LEGEND

**B-1** Approximate Location of Soil Boring by Murray Engineers, Inc., May 29, 2018

**CPT-1** Approximate Location of Hand Auger by Murray Engineers, Inc., May 30, 2018

Base: Trees of Washington Park by Bob Disco and Doug Geitel, dated Summer 2003

Approximate Scale: 1 inch = 100 feet

## KEY NOTES

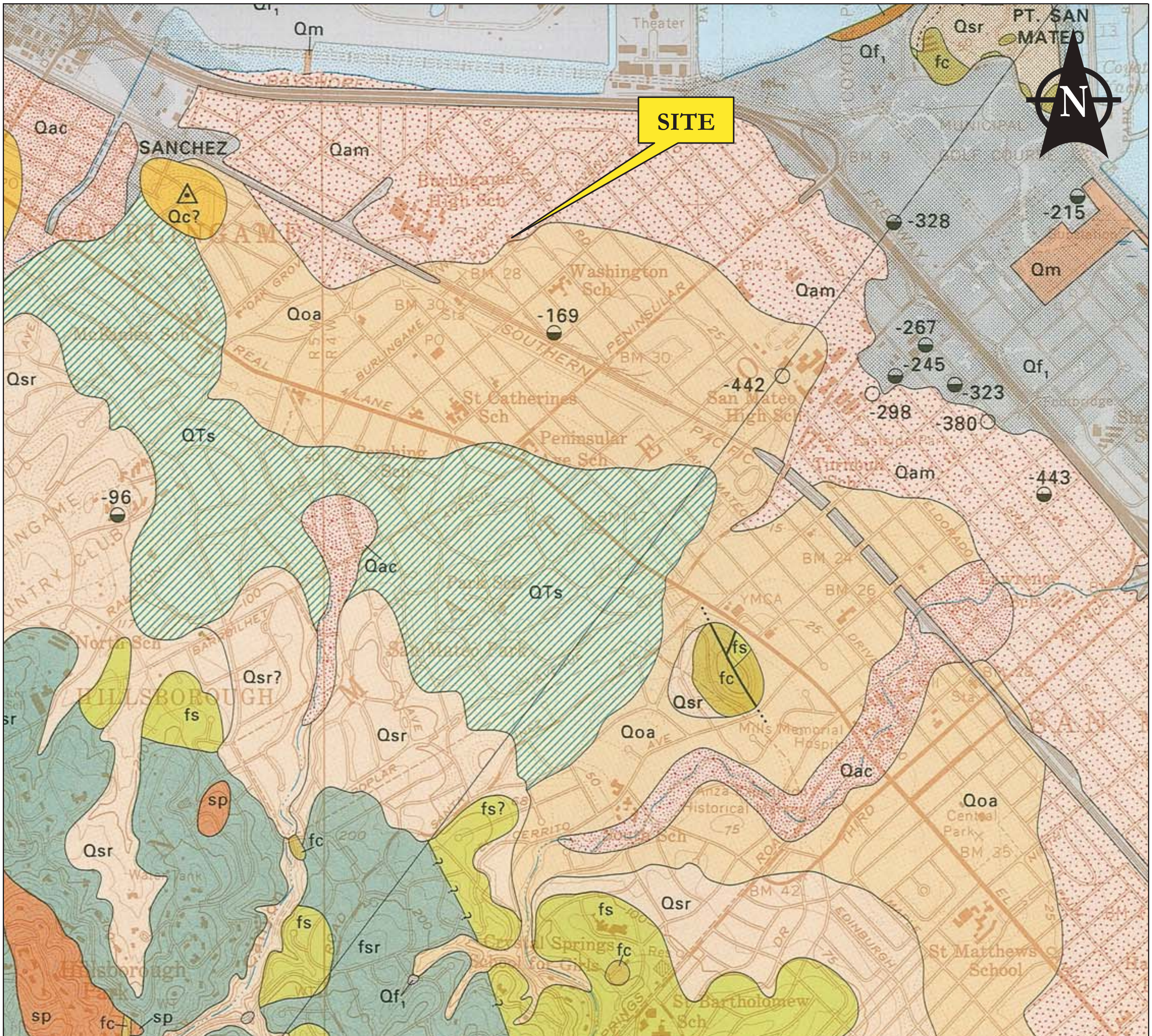
1. Outline of (E) One-Story Building to be Demolished (Dashed)
2. Outline of (N) Two-Story Building (Solid)
3. Area of (N) Underground Parking (Hatched)

MURRAY ENGINEERS INC
GEOTECHNICAL SERVICES

**SITE PLAN**

**BURLINGAME COMMUNITY CENTER**
**850 BURLINGAME AVENUE**
**BURLINGAME, CALIFORNIA**

| PROJECT NO. 3053-1R1 | JULY 2018 | FIGURE A-2 |
|---|---|---|

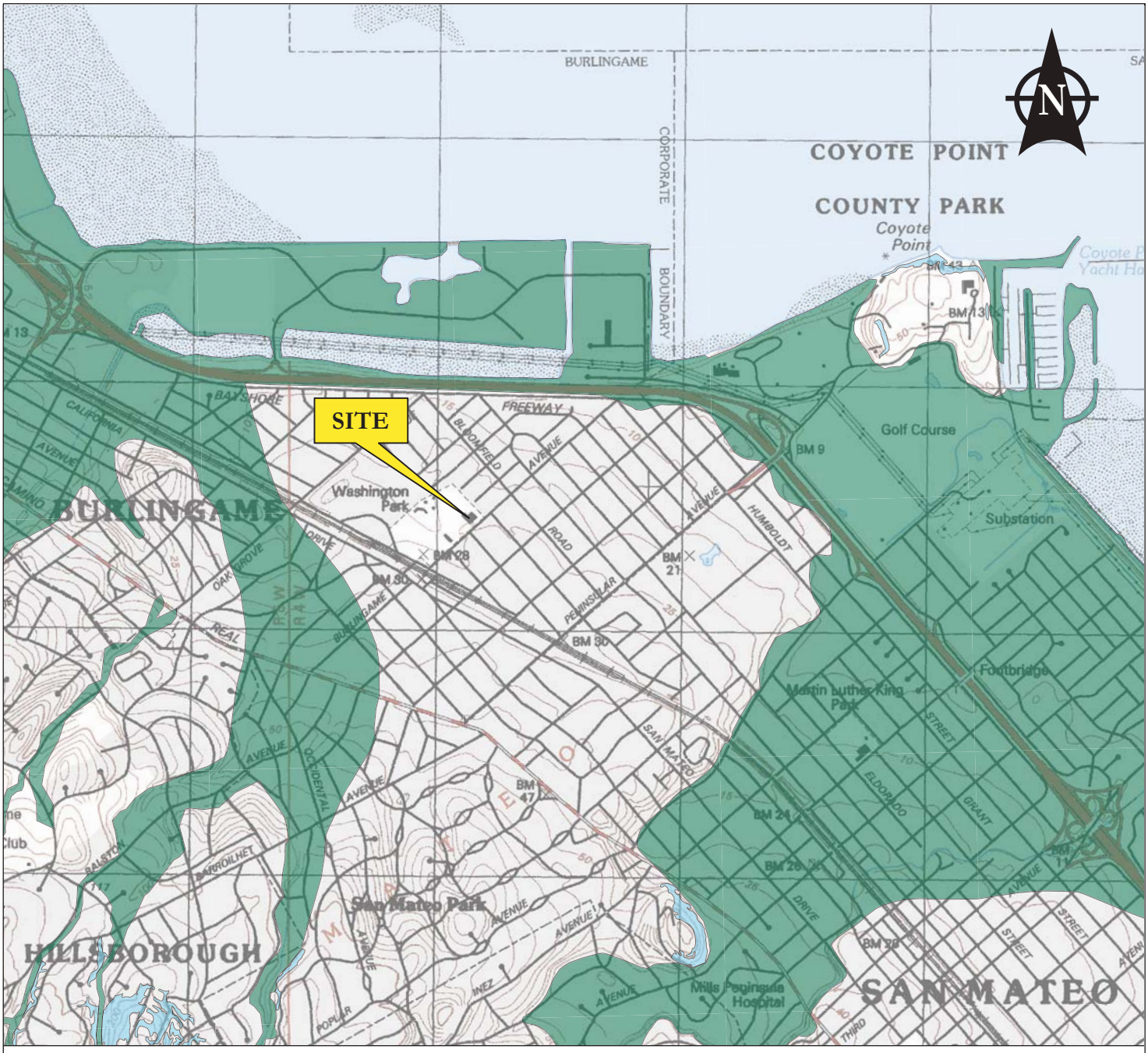



## Legend & Selected Map Symbols

| | | | |
|---|---|---|---|
| QTs | Sedimentary Deposits | | Contact |
| Qam | Medium-Grained Alluvium | ?—?—? | Contact; unknown |
| Qoa | Older Alluvium | | |

Base: Geologic Map of the Montara Mountain and San Mateo 7.5" Quadrangles, San Mateo County, by Earl H. Pampeyan, 1993 Please refer to the Geology section of this report for a description of pertinent geologic symbols noted above. Scale: 1 inch = 2000 feet

| | | |
|---|---|---|
| MURRAY ENGINEERS INC GEOTECHNICAL SERVICES | **BURLINGAME COMMUNITY CENTER<br>850 BURLINGAME AVENUE<br>BURLINGAME, CALIFORNIA** | **VICINITY GEOLOGIC MAP** |
| **PROJECT NO. 3053-1R1** | **JULY 2018** | **FIGURE A-3** |



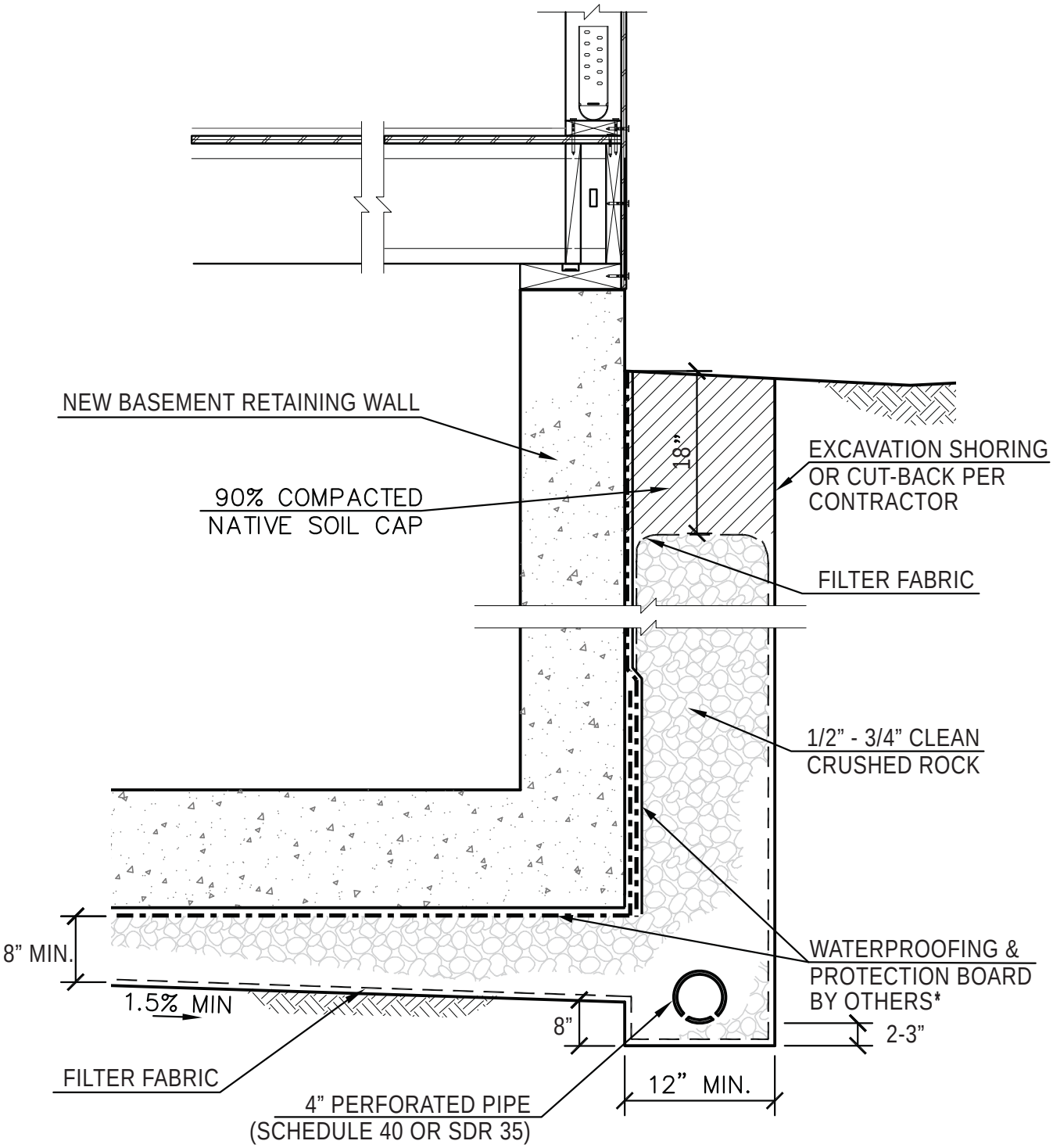

## Legend

Areas where historic occurrence of liquefaction, or local, geological, geotechnical and groundwater conditions indicate a potential for earthquake-induced liquefaction

Areas where previous occurence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for earthquake-induced landslide

Base: Earthquake Zones of Required Investigations, San Mateo Quadrangle by California Geological Survey, 2018 Scale: 1 inch = 2,000 feet

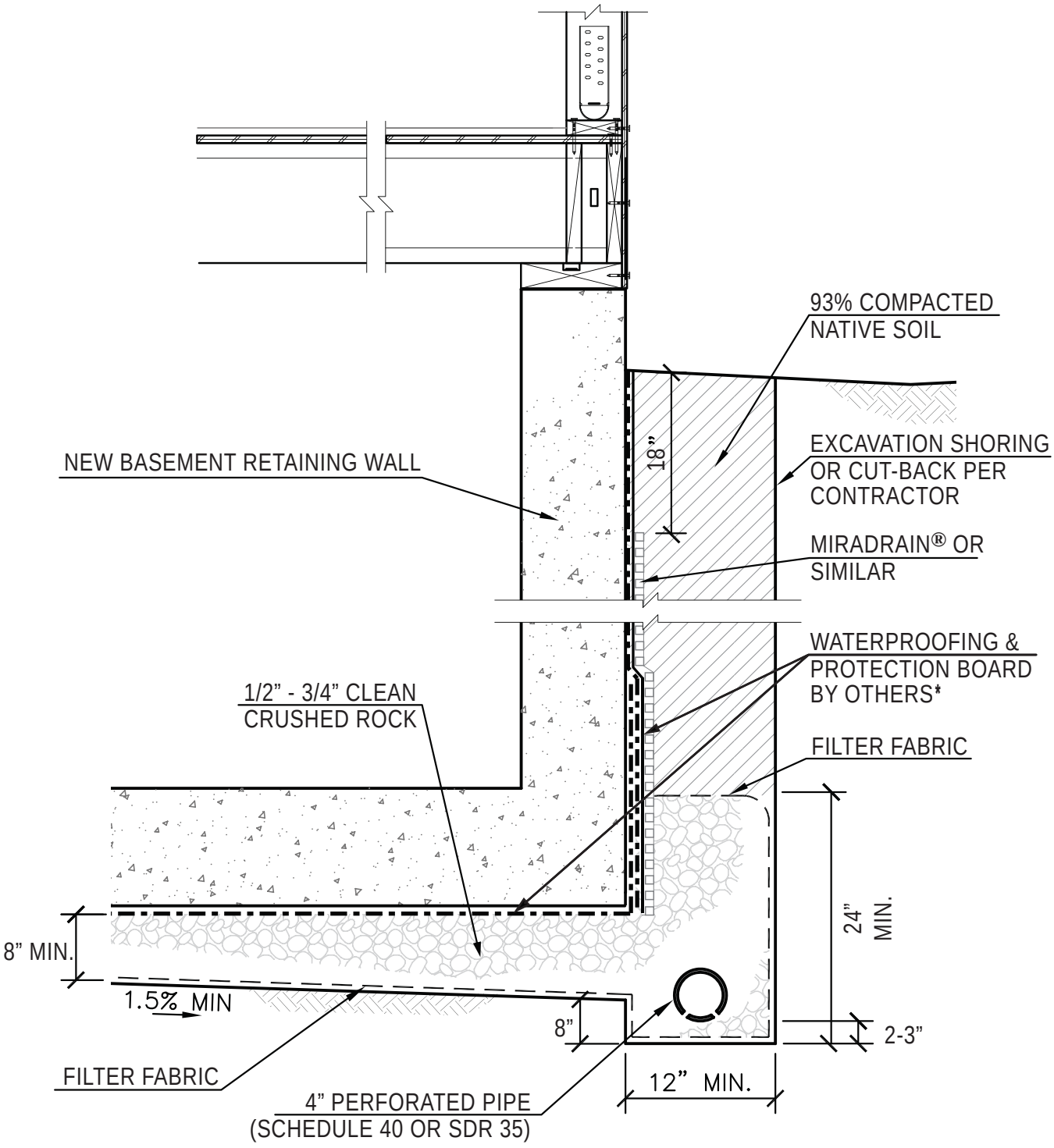
| MURRAY ENGINEERS INC GEOTECHNICAL SERVICES | BURLINGAME COMMUNITY CENTER<br>850 BURLINGAME AVENUE<br>BURLINGAME, CALIFORNIA | | STATE FAULT &<br>SEISMIC HAZARD<br>ZONES MAP |
|---|---|---|---|
| | PROJECT NO. 3053-1R1 | JULY 2018 | FIGURE A-4 |




**NOT TO SCALE** *** MiraDRAIN® is not recommended as protection board for waterproofing**

**Note: This diagram is provided solely to schematically depict the recommendations presented in this report for the basement and basement retaining wall subdrainage. Reference to the basement slab and wall, framing, waterproofing, and extent of excavation are only shown for clarity.**

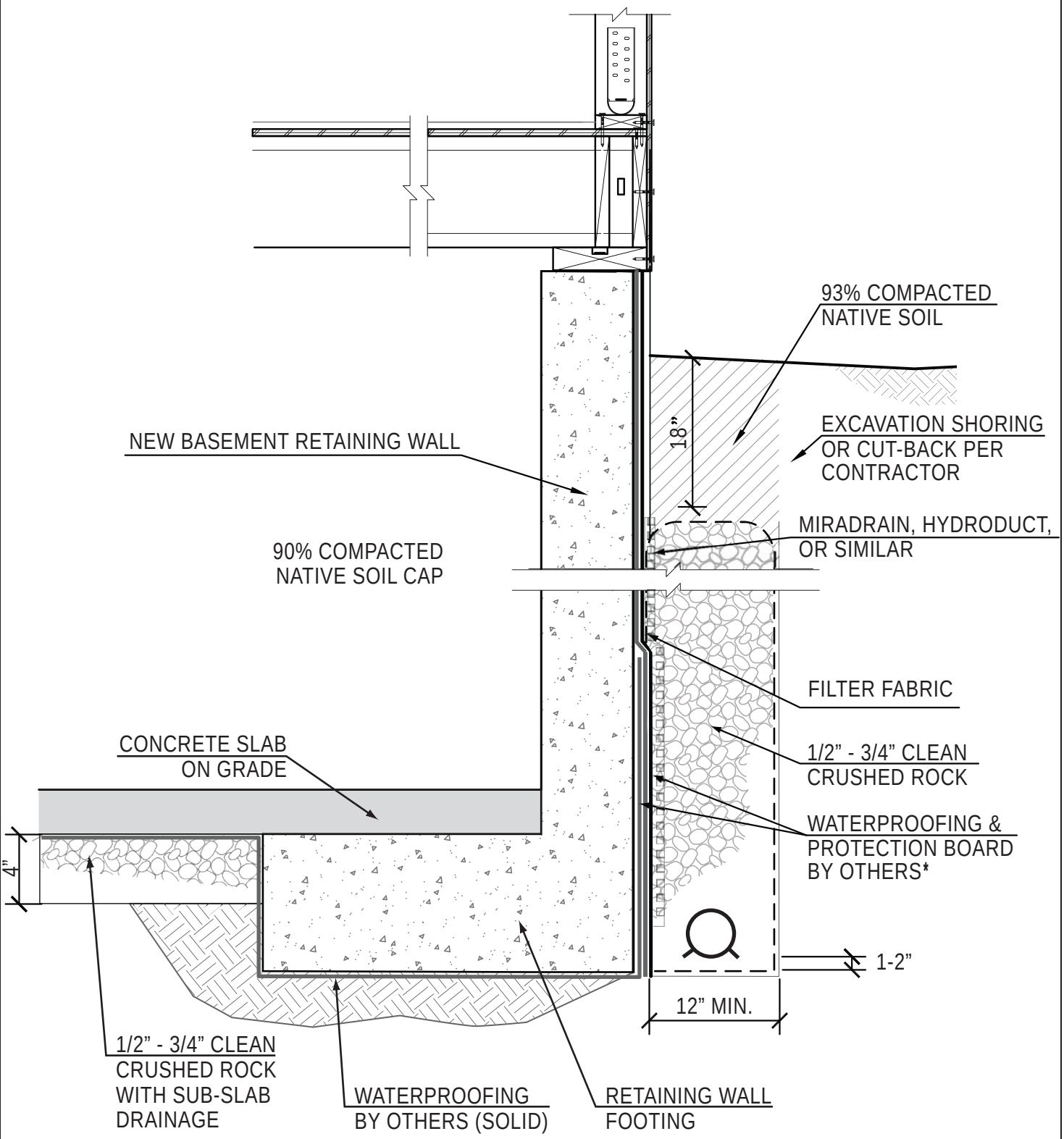
| | | |
|---|---|---|
| MURRAY ENGINEERS INC GEOTECHNICAL SERVICES | **BURLINGAME COMMUNITY CENTER<br>850 BURLINGAME AVENUE<br>BURLINGAME, CALIFORNIA** | **BASEMENT<br>SUBDRAIN SYSTEM<br>ALTERNATIVE A** |
| | **PROJECT NO. 3053-1R1** / **JULY 2018** | **FIGURE A-5** |




**NOT TO SCALE** *** MiraDRAIN® is not recommended as protection board for waterproofing**

**Note: This diagram is provided solely to schematically depict the recommendations presented in this report for the basement and basement retaining wall subdrainage. Reference to the basement slab and wall, framing, waterproofing, and extent of excavation are only shown for clarity.**

| | | |
|---|---|---|
| MURRAY ENGINEERS INC GEOTECHNICAL SERVICES | **BURLINGAME COMMUNITY CENTER<br>850 BURLINGAME AVENUE<br>BURLINGAME, CALIFORNIA** | **BASEMENT<br>SUBDRAIN SYSTEM<br>ALTERNATIVE B** |
| | **PROJECT NO. 3053-1R1** / **JULY 2018** | **FIGURE A-6** |

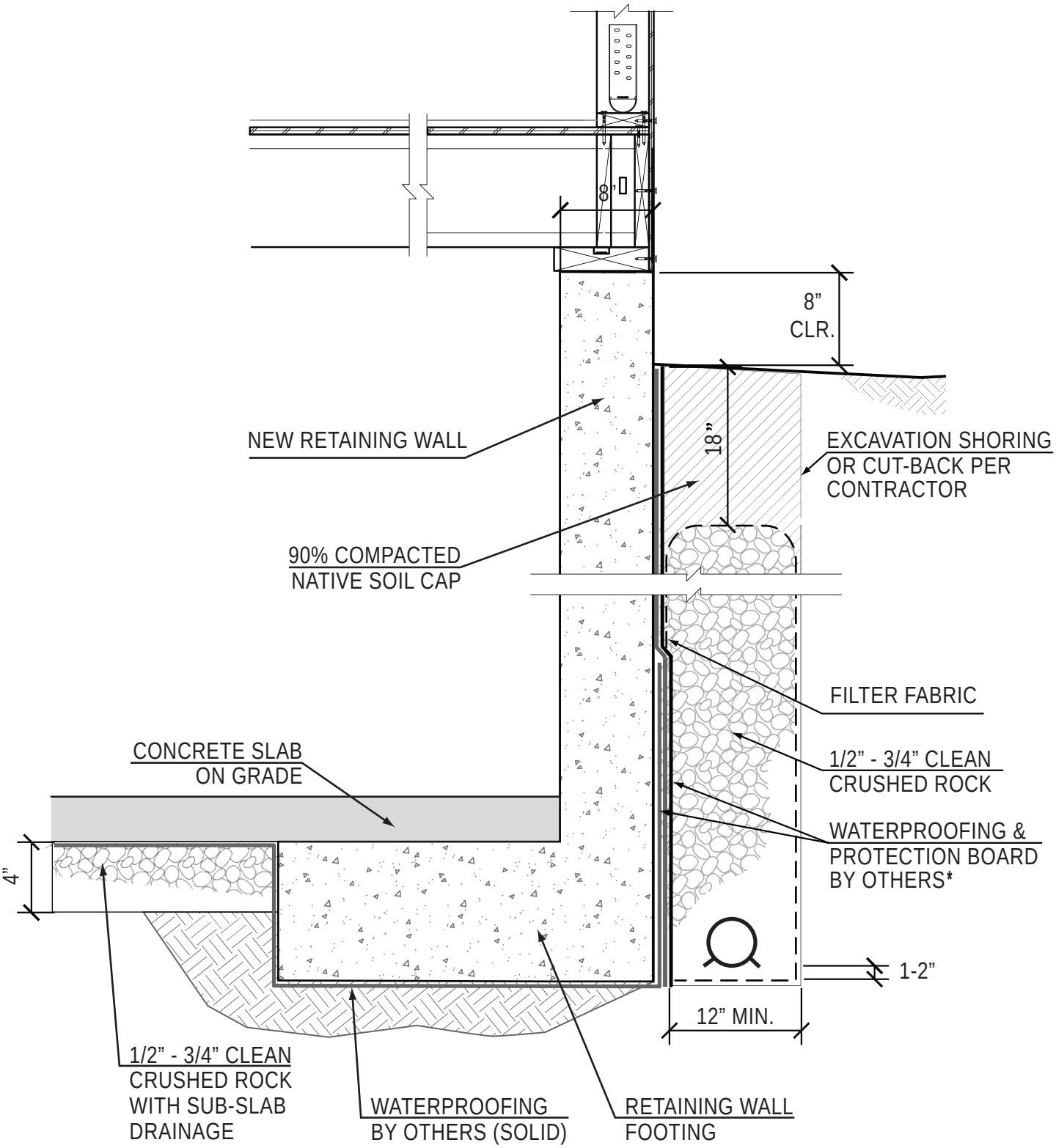



**NOT TO SCALE**

*** MiraDRAIN is not recommended as protection board for waterproofing**

**Note: This diagram is provided solely to schematically depict the recommendations presented in this report for the basement and basement retaining wall subdrainage. Reference to the basement slab and wall, framing, waterproofing, and extent of excavation are only shown for clarity.**

| | | |
|---|---|---|
| MURRAY ENGINEERS INC GEOTECHNICAL SERVICES | **BURLINGAME COMMUNITY CENTER**<br>**850 BURLINGAME AVENUE**<br>**BURLINGAME, CALIFORNIA** | **RETAINING WALL SUBDRAIN SYSTEM ALTERNATIVE C** |
| **PROJECT NO. 3053-1R1** | **JULY 2018** | **FIGURE A-7** |




**NOT TO SCALE** *** MiraDRAIN is not recommended as protection board for waterproofing**

**Note: This diagram is provided solely to schematically depict the recommendations presented in this report for the retaining wall subdrainage. Reference to the floor slab and retaining wall, framing, waterproofing, and extent of excavation are only shown for clarity.**

| MURRAY ENGINEERS INC GEOTECHNICAL SERVICES | BURLINGAME COMMUNITY CENTER<br>850 BURLINGAME AVENUE<br>BURLINGAME, CALIFORNIA | | RETAINING WALL<br>SUBDRAIN SYSTEM<br>ALTERNATIVE A |
|---|---|---|---|
| | PROJECT NO. 3053-1R1 | JULY 2018 | FIGURE A-8 |

| | | |
|---|---|---|
| Date(s) Drilled **May 29, 2018** | Logged By **NL** | Checked By **JK** |
| Drilling Method **Interval Sampling** | Drill Bit Size/Type | Total Depth of Borehole **50 feet bgs** |
| Drill Rig Type **Mobile B53R** | Drilling Contractor **Exploration Geoservices, Inc.** | Approximate Surface Elevation |
| Groundwater Level and Date Measured **25.5 feet ATD** | Sampling Method(s) **3" OD, 2.5" OD & 2" OD SPT Split Spoon Samplers** | Hammer Data **140 lb, 30 in drop, rope & cathead** |
| Borehole Backfill **Grout** | Location **South side of proposed building** | |

| Elevation, feet | Depth, feet | Sample Type | Sampling Resistance, blows/foot | Relative Consistency | USCS Symbol | MATERIAL DESCRIPTION | Water Content, % | Torvane Shear Strength (TSF) | Pocket Pen Comp. Strength, TSF | Dry Density (PCF) |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | 40 | Hard | CL | LEAN CLAY, brown to yellowish brown, homogeneous, low plasticity, trace fine to medium grained sand, trace subangular gravels, slightly moist (Alluvium) | | | | |
| | | | 49 | | | | | | | |
| | 5 | | 53 | | | | | | | |
| | 10 | | 58 | Very Dense | SC | CLAYEY SAND with GRAVEL, dark yellowish brown, homogeneous, low plasticity fines, fine to coarse grained sand, subangular gravel, moist (Alluvium) Cohesion=400psf, Phi=34 degrees (sample from 8.5 to 10 feet) | 11 | | | 116 |
| | 15 | | 46 | Hard | CL | LEAN CLAY with SAND, yellowish brown, heterogeneous, low to medium plasticity, fine to coarse grained sand, trace to minor subangular gravels, very moist (Alluvium) | 18 | 1.4 | 4.0 | |
| | 20 | | 62 | | | | 20 | 0.8 | 3.0 | 111 |
| | 25 | | 71 | | | (ATD) | 16 | | 4.0 | |
| | 30 | | 63 | Hard | CL | LEAN CLAY, dark yellowish brown, homogeneous, medium plasticity, trace very fine to fine grained sand, very moist (Alluvium) | 22 | 0.5 | 1.0 | 104 |
| | 35 | | 65 | | | | 20 | 1.6 | 4.0 | |
| | 40 | | 48 | | | | 23 | | 2.5 | |
| | 45 | | 95 | Very Dense | SC | CLAYEY SAND, yellowish brown, heterogeneous, low to medium plasticity fines, fine to coarse grained sand, trace subangular gravels, moist (Alluvium) | 12 | | 2.5 | |
| | 50 | | 94 | | | Bottom of Boring at 50 feet bgs | 14 | | | |

MURRAY ENGINEERS INC
GEOTECHNICAL SERVICES

**BURLINGAME COMMUNITY CENTER**
**850 BURLINGAME AVENUE**
**BURLINGAME, CALIFORNIA**

**LOG OF BORING B-1**

**PROJECT NO. 3053-1R1** | **JULY 2018** | **FIGURE B-1**

M:\BORINGS\CityofBurlingame - 3053-1.bgs [123 Murray 52 - WC, PP, TV, DD.tpl]

| | | | | | |
|---|---|---|---|---|---|
| Date(s) Drilled | **May 29, 2018** | Logged By | **NL** | Checked By | **JK** |
| Drilling Method | **5' Interval Sampling** | Drill Bit Size/Type | **8 inch hollow stem auger** | Total Depth of Borehole | **49.8 feet** |
| Drill Rig Type | **Mobile B53R** | Drilling Contractor | **Exploration Geoservices, Inc.** | Approximate Surface Elevation | |
| Groundwater Level and Date Measured | **27 feet ATD** | Sampling Method(s) | **3" OD, 2.5" OD & 2" OD SPT Split Spoon Samplers** | Hammer Data | **140 lb, 30 in drop, rope & cathead** |
| Borehole Backfill | **Grout** | Location | **North east of proposed building, near CPT-3** | | |

| Elevation, feet | Depth, feet | Sample Type | Sampling Resistance, blows/foot | Relative Consistency | USCS Symbol | MATERIAL DESCRIPTION | Water Content, % | Torvane Shear Strength (TSF) | Pocket Pen Comp. Strength, TSF | Dry Density (PCF) |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | 18 | Very Stiff to Hard | CL | LEAN CLAY, brown to yellowish brown, homogeneous, low plasticity, trace fine to medium grained sand, trace subangular gravels, moist (Alluvium) PI=10%; LL=25% (sample from 0.5 to 2 feet) | 15 | 0.8 | 3.0 | |
| | | | 48 | | | | 14 | | >4.5 | |
| | 5 | | 68 | | | | | | | |
| | 10 | | 41 | Dense to Very Dense | SC | CLAYEY SAND with GRAVEL, dark yellowish brown, homogeneous, low plasticity fines, fine to coarse grained sand, subangular gravel, slightly moist to moist (Alluvium) | 8 | | | |
| | 15 | | 50 | | | | 12 | | >4.5 | 115 |
| | 20 | | 56 | | | | 11 | | >4.5 | |
| | 25 | | 71 | | | | 13 | 1.3 | 4.0 | |
| | | | | | | (ATD) ▽ | | | | |
| | 30 | | 92 | | | | 15 | | 3.0 | |
| | 35 | | 64 | | | | 13 | | | 117 |
| | 40 | | 50/3" | | | | 13 | | | |
| | 45 | | 52 | Very Dense | SM | SILTY SAND, dark yellowish brown, heterogeneous, medium to coarse grained sand, very moist to moist (Alluvium) | 23 | | | |
| | 50 | | 71/9" | | | | 9 | | | |

Bottom of Boring at 49.8 feet bgs

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**BURLINGAME COMMUNITY CENTER**
**850 BURLINGAME AVENUE**
**BURLINGAME, CALIFORNIA**

**LOG OF BORING B-2**

**PROJECT NO. 3053-1R1** | **JULY 2018** | **FIGURE B-2**

M:\BORINGS\CityofBurlingame - 3053-1.bgs [123 Murray 52 - WC, PP, TV, DD.tpl]

| Elevation, feet | Depth, feet | Sample Type | Sampling Resistance, blows/foot | Relative Consistency | USCS Symbol | MATERIAL DESCRIPTION | Water Content, % | Torvane Shear Strength (TSF) | Pocket Pen Comp. Strength, TSF |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

## COLUMN DESCRIPTIONS

1 **Elevation, feet:** Elevation (MSL, feet)

2 **Depth, feet:** Depth in feet below the ground surface.

3 **Sample Type:** Type of soil sample collected at the depth interval shown.

4 **Sampling Resistance, blows/foot:** Number of blows required to advance the sampler 12 inches or the distance shown. Blow counts for the 3.0-inch O.D. and 2.5-inch O.D. samplers have been corrected for sampler size to SPT values using conversion factors of 0.65 and 0.77, respectively.

5 **Relative Consistency:** Relative consistency of the subsurface material.

6 **USCS Symbol:** USCS symbol of the subsurface material.

7 **MATERIAL DESCRIPTION:** Description of material encountered. May include consistency, moisture, color, and other descriptive text.

8 **Water Content, %:** Water content of the soil sample, expressed as percentage of dry weight of sample.

9 **Torvane Shear Strength (TSF):** Approximate shear strength in tons per square foot.

10 **Pocket Pen Comp. Strength, TSF:** Approximate unconfined compressive strength in tons per square foot.

## FIELD AND LABORATORY TEST ABBREVIATIONS

**CHEM:** Chemical tests to assess corrosivity
**COMP:** Compaction test
**CONS:** One-dimensional consolidation test
**LL:** Liquid Limit, percent
**PI:** Plasticity Index, percent
**SA:** Sieve analysis (percent passing No. 200 Sieve)
**UC:** Unconfined compressive strength test, Qu, in ksf
**WA:** Wash sieve (percent passing No. 200 Sieve)

## TYPICAL MATERIAL GRAPHIC SYMBOLS

- Sandstone
- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- Well graded GRAVEL with Silt (GW-GM)
- Well graded GRAVEL with Clay (GW-GC)
- Poorly graded GRAVEL with Silt (GP-GM)
- Poorly graded GRAVEL with Clay (GP-GC)
- Silty GRAVEL (GM)
- Clayey GRAVEL (GC)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- Well graded SAND with Silt (SW-SM)
- Well graded SAND with Clay (SW-SC)
- Poorly graded SAND with Silt (SP-SM)
- Poorly graded SAND with Clay (SP-SC)
- Silty SAND (SM)
- Clayey SAND (SC)
- SILT, SILT w/SAND, SANDY SILT (ML)
- Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)
- SILT, SILT w/SAND, SANDY SILT (MH)
- Fat CLAY, CLAY w/SAND, SANDY CLAY (CH)
- SILT, SILT with SAND, SANDY SILT (ML-MH)
- Lean-Fat CLAY, CLAY w/SAND, SANDY CLAY (CL/CH)
- SILTY CLAY (CL-ML)
- Lean CLAY/PEAT (CL-OL)
- Fat CLAY/SILT (CH-MH)
- Fat CLAY/PEAT (CH-OH)
- Silty SAND to Sandy SILT (SM-ML)
- Silty SAND to Sandy SILT (SM-MH)
- Clayey SAND to Sandy CLAY (SC-CL)
- Clayey SAND to Sandy CLAY (SC-CH)
- SILT to CLAY (CL/ML)
- Silty to Clayey SAND (SC/SM)

## TYPICAL SAMPLER GRAPHIC SYMBOLS

- 2 inch-OD Unlined Split Spoon (SPT)
- 2.5 inch-OD Unlined Split Spoon
- 3 inch-OD Unlined Split Spoon
- Shelby Tube (thin-walled, fixed head)
- Grab Sample
- Bulk Sample
- Pitcher Sample
- Other Sampler

## OTHER GRAPHIC SYMBOLS

- Water level (at time of drilling, ATD)
- Water level (after waiting a given time)
- Minor change in material properties within a stratum
- Inferred or gradational contact between strata
- ? Queried contact between strata

## GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

| PRIMARY DIVISIONS | | | SOIL TYPE | SECONDARY DIVISIONS |
|---|---|---|---|---|
| COARSE GRAINED SOILS *(<50% Fines)* | GRAVEL | CLEAN GRAVEL *(<5% Fines)* | **GW** | Well graded gravel, gravel-sand mixtures, little or no fines. |
| | | | **GP** | Poorly graded gravel or gravel-sand mixtures, little or no fines. |
| | | GRAVEL *with* FINES | **GM** | Silty gravels, gravel-sand-silt mixtures, non-plastic fines. |
| | | | **GC** | Clayey gravels, gravel-sand-clay mixtures, plastic fines. |
| | SAND | CLEAN SAND *(<5% Fines)* | **SW** | Well graded sands, gravelly sands, little or no fines. |
| | | | **SP** | Poorly graded sands or gravelly sands, little or no fines. |
| | | SAND *with* FINES | **SM** | Silty sands, sand-silt mixtures, non-plastic fines. |
| | | | **SC** | Clayey sands, sand-clay mixtures, plastic fines. |
| FINE GRAINED SOILS *(>50% Fines)* | SILT AND CLAY *Liquid limit <50%* | | **ML** | Inorganic silts and very fine sands, with slight plasticity. |
| | | | **CL** | Inorganic clays of low to medium plasticity, lean clays. |
| | | | **OL** | Organic silts and organic clays of low plasticity. |
| | SILT AND CLAY *Liquid limit >50%* | | **MH** | Inorganic silt, micaceous or diatomaceous fine sandy or silty soil. |
| | | | **CH** | Inorganic clays of high plasticity, fat clays. |
| | | | **OH** | Organic clays of medium to high plasticity, organic silts. |
| HIGHLY ORGANIC SOILS | | | **Pt** | Peat and other highly organic soils. |

## RELATIVE DENSITY

| SAND & GRAVEL | BLOWS/FOOT* |
|---|---|
| VERY LOOSE | 0 to 4 |
| LOOSE | 4 to 10 |
| MEDIUM DENSE | 10 to 30 |
| DENSE | 30 to 50 |
| VERY DENSE | OVER 50 |

## CONSISTENCY

| SILT & CLAY | STRENGTH^ | BLOWS/FOOT* |
|---|---|---|
| VERY SOFT | 0 to 0.25 | 0 to 2 |
| SOFT | 0.25 to 0.5 | 2 to 4 |
| MEDIUM STIFF | 0.5 to 1 | 4 to 8 |
| STIFF | 1 to 2 | 8 to 16 |
| VERY STIFF | 2 to 4 | 16 to 32 |
| HARD | OVER 4 | OVER 32 |

## GRAIN SIZES

| BOULDERS | COBBLES | GRAVEL | | SAND | | | SILT & CLAY |
|---|---|---|---|---|---|---|---|
| | | COARSE | FINE | COARSE | MEDIUM | FINE | |

12" 3" 3/4" 4 10 40 200

SIEVE OPENINGS U.S. STANDARD SERIES SIEVE

Classification is based on the Unified Soil Classification System; fines refer to soil passing a No. 200 sieve.

*Standard penetration test (SPT) resistance using a 140-pound hammer falling 30 inches on a 2-inch outside diameter split spoon sampler; blow counts for the 3.0-inch O.D. and 2.5-inch O.D. samplers have been corrected for sampler size to SPT values using conversion factors of 0.65 and 0.77, respectively.

^ Shear strength in tons/sq. ft. as estimated by SPT resistance, field and laboratory tests, and/or visual observation.

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**BURLINGAME, CALIFORNIA**

**UNIFIED SOIL CLASSIFICATION SYSTEM**

**PROJECT NO. 3053-1R1** | **JULY 2018** | **FIGURE B-4**

# APPENDIX C

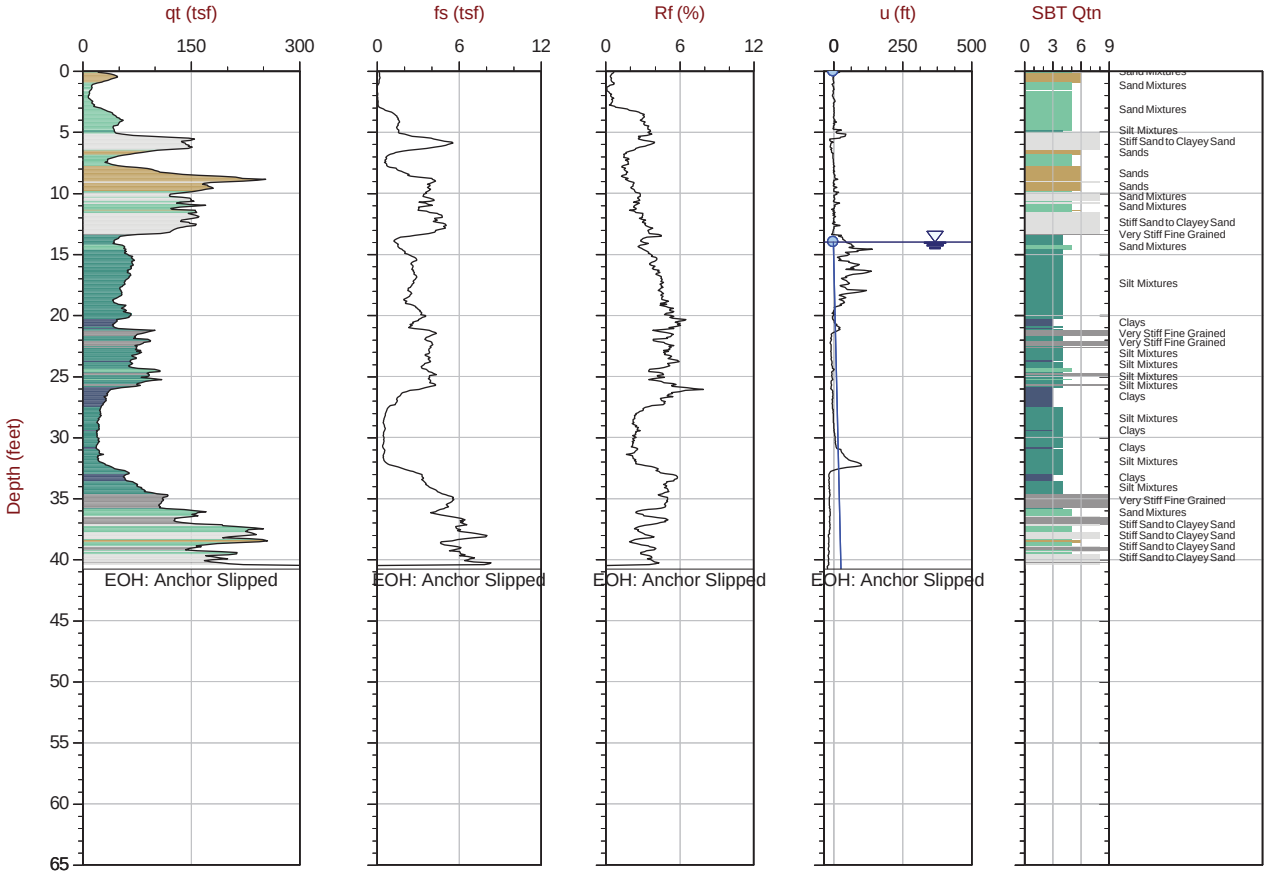
# SUBSURFACE EXPLORATION – CONE PENERATION TESTS

CALIFORNIA PUSH TECHNOLOGIES INCORPORATED

**Murray Engineers**

Job No: 18-56086
Date: 2018-05-30 08:47
Site: Burlingame Community Center

Sounding: CPT-01
Cone: 391:T1500F15U500




Max Depth: 12.425 m / 40.76 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56086_CP01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10 N N: 4159605m E: 557991m
Sheet No: 1 of 1

Overplot Item: Ueq, Assumed Ueq, Dissipation, Ueq achieved, Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Base: Log of CPT-1 produced by CPT-Pro (Version 5.42). Soil classifications and N60 SPT corrected blow count data are based on Robertson, 1986 (see Figure C-4, Key to Soil Behavior Types).

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GEOTECHNICAL SERVICES

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**BURLINGAME, CALIFORNIA**

**LOG OF CPT-1**

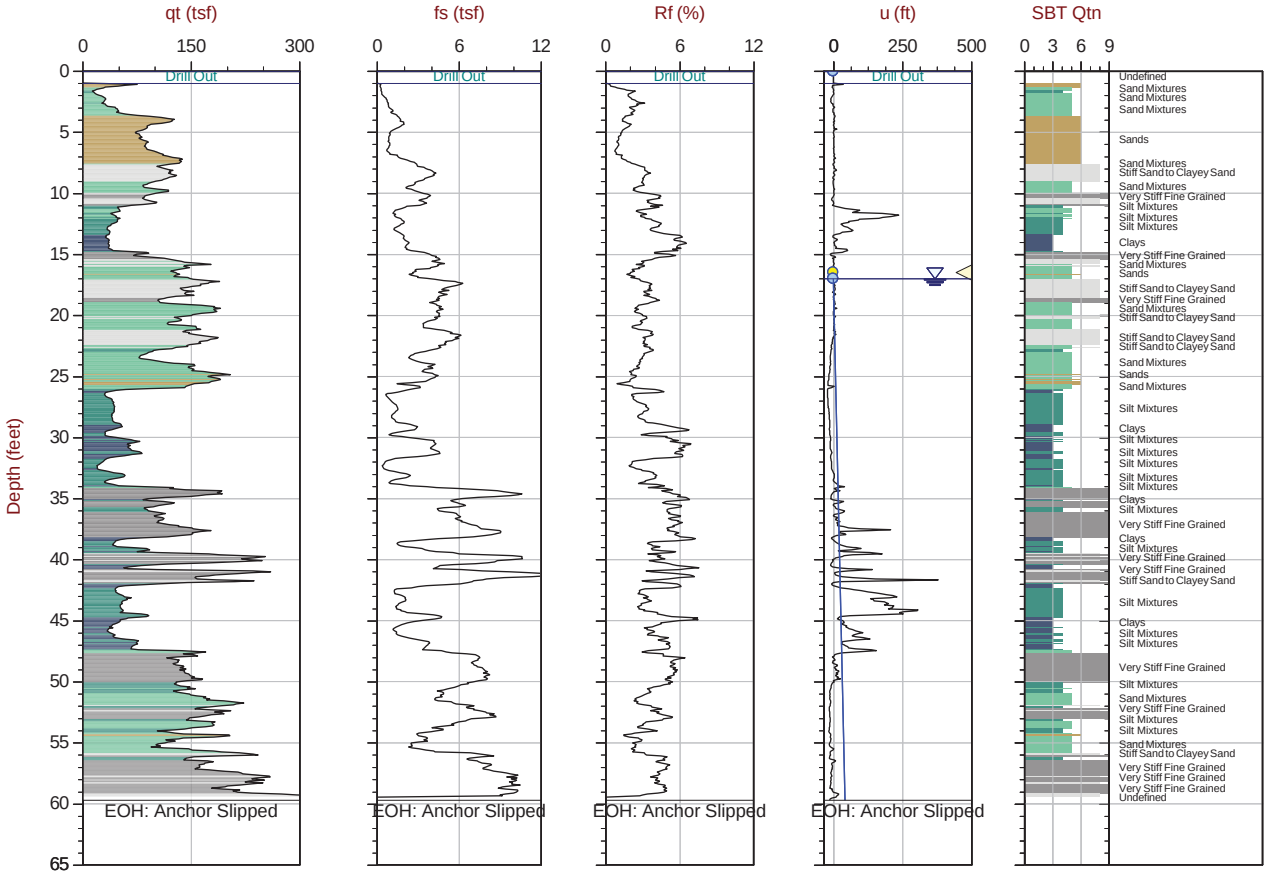
**PROJECT NO. 3053-1R1** | **JULY 2018** | **FIGURE C-1**

CALIFORNIA PUSH TECHNOLOGIES INCORPORATED

**Murray Engineers**

Job No: 18-56086
Date: 2018-05-30 12:52
Site: Burlingame Community Center

Sounding: CPT-02
Cone: 391:T1500F15U500




Max Depth: 18.200 m / 59.71 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56086_CP03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10 N N: 4159658m E: 558082m
Sheet No: 1 of 1

Overplot Item: Ueq, Assumed Ueq, Dissipation, Ueq achieved, Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Base: Log of CPT-1 produced by CPT-Pro (Version 5.42). Soil classifications and N60 SPT corrected blow count data are based on Robertson, 1986 (see Figure C-4, Key to Soil Behavior Types).

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GEOTECHNICAL SERVICES

**BURLINGAME COMMUNITY CENTER**
**850 BURLINGAME AVENUE**
**BURLINGAME, CALIFORNIA**

**LOG OF CPT-2**

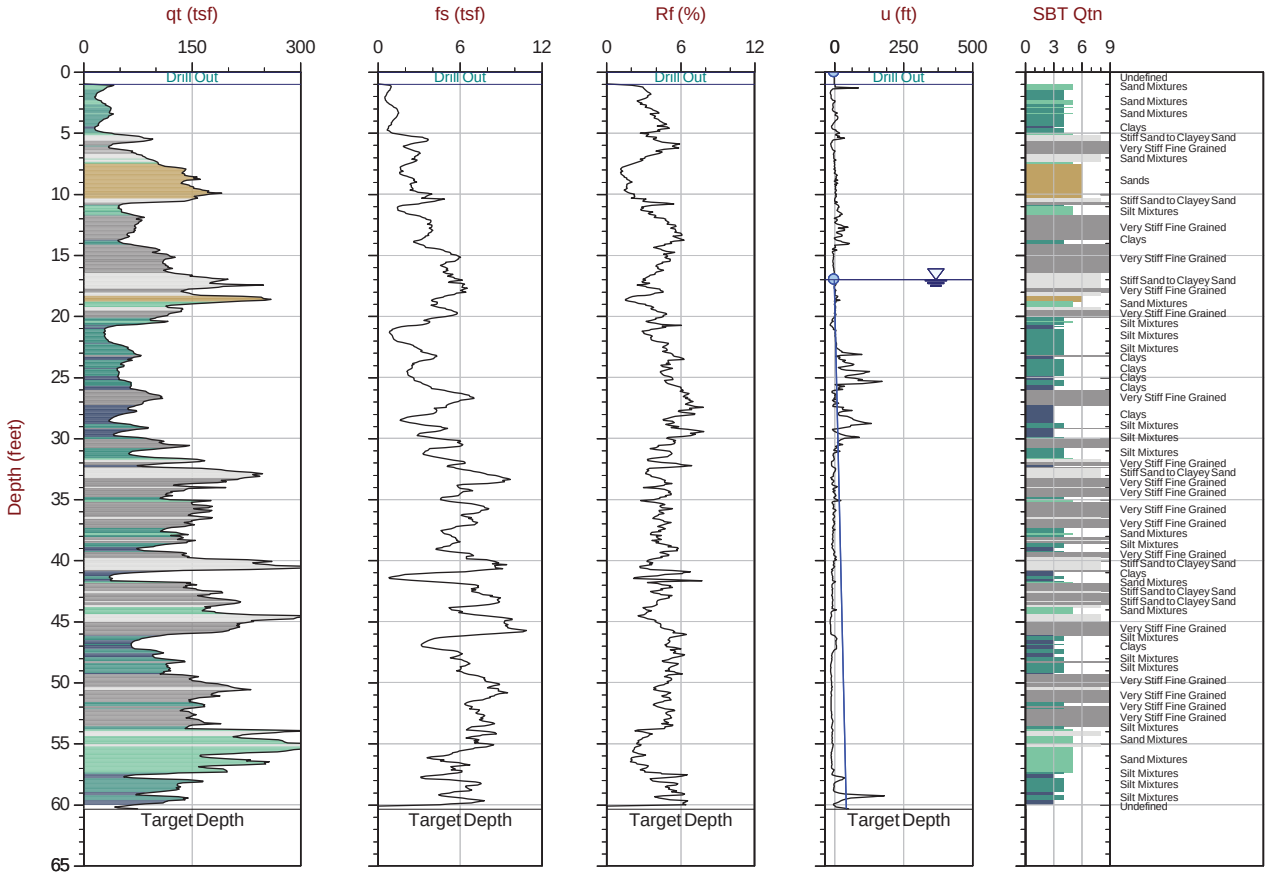
**PROJECT NO. 3053-1R1** | **JULY 2018** | **FIGURE C-2**

CALIFORNIA PUSH TECHNOLOGIES INCORPORATED

**Murray Engineers**

Job No: 18-56086
Date: 2018-05-30 11:00
Site: Burlingame Community Center

Sounding: CPT-03
Cone: 391:T1500F15U500




Max Depth: 18.400 m / 60.37 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56086_CP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10 N N: 4159702m E: 558042m
Sheet No: 1 of 1

Overplot Item: Ueq, Assumed Ueq, Dissipation, Ueq achieved, Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Base: Log of CPT-1 produced by CPT-Pro (Version 5.42). Soil classifications and N60 SPT corrected blow count data are based on Robertson, 1986 (see Figure C-4, Key to Soil Behavior Types).

MURRAY ENGINEERS INC
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**BURLINGAME COMMUNITY CENTER**
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**BURLINGAME, CALIFORNIA**

**LOG OF CPT-3**

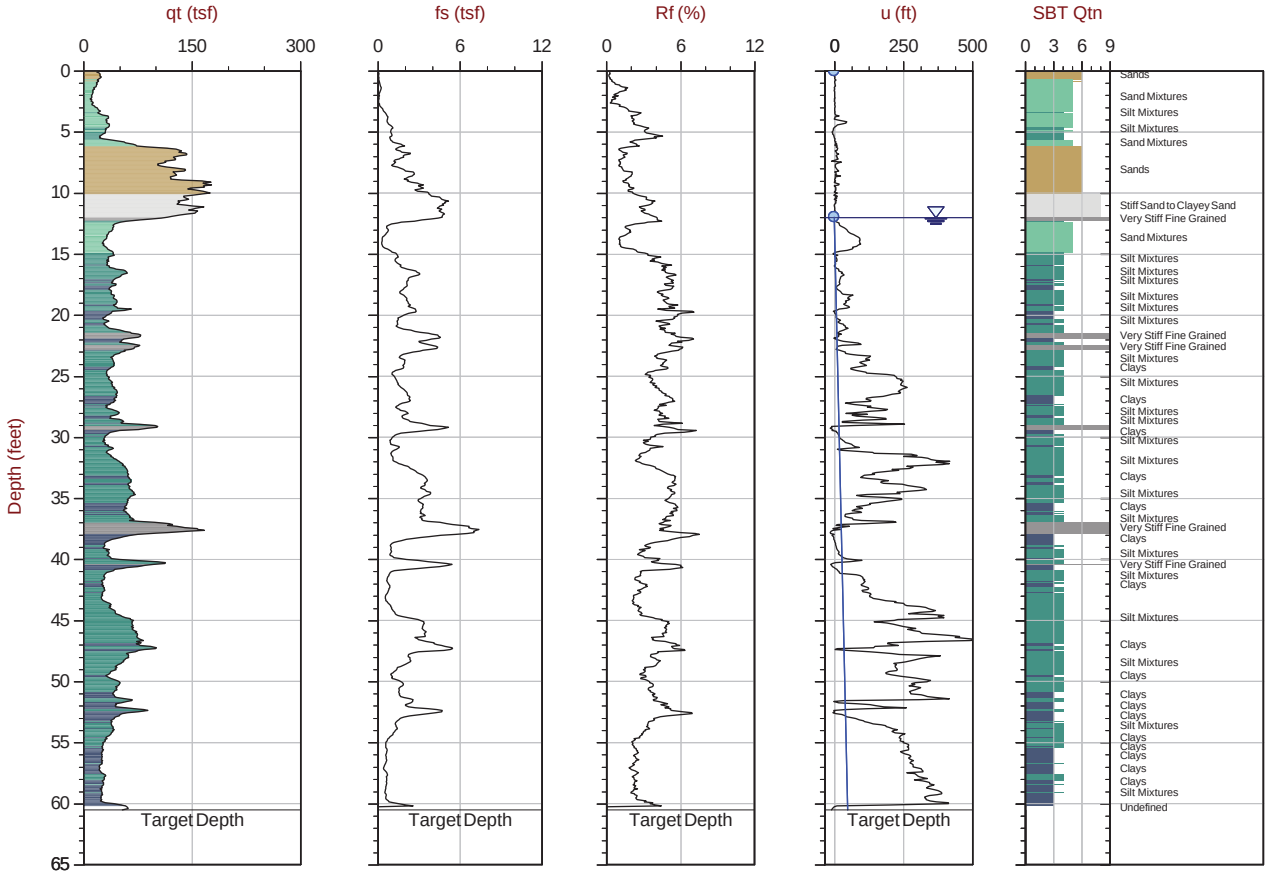
**PROJECT NO. 3053-1R1** | **JULY 2018** | **FIGURE C-3**

CALIFORNIA PUSH TECHNOLOGIES INCORPORATED

**Murray Engineers**

Job No: 18-56086
Date: 2018-05-30 09:44
Site: Burlingame Community Center

Sounding: CPT-04
Cone: 391:T1500F15U500




Max Depth: 18.450 m / 60.53 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 18-56086_CP05.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 10 N N: 4159660m E: 557990m
Sheet No: 1 of 1

Overplot Item: Ueq, Assumed Ueq, Dissipation, Ueq achieved, Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Base: Log of CPT-1 produced by CPT-Pro (Version 5.42). Soil classifications and N60 SPT corrected blow count data are based on Robertson, 1986 (see Figure C-4, Key to Soil Behavior Types).

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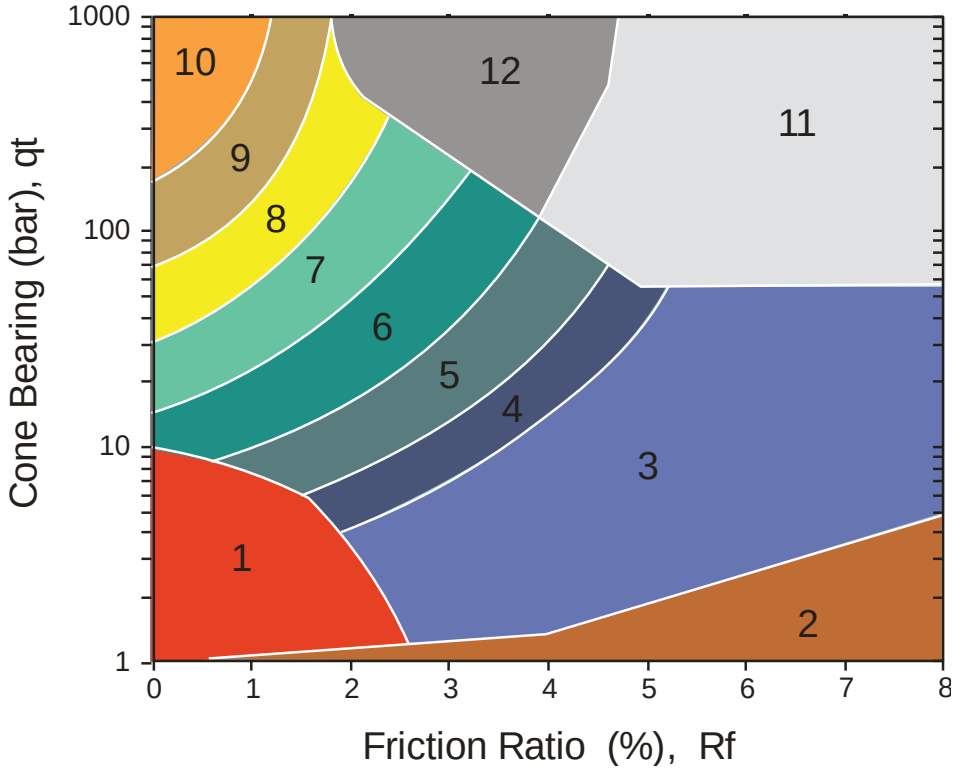
**BURLINGAME, CALIFORNIA**

**LOG OF CPT-4**

**PROJECT NO. 3053-1R1** | **JULY 2018** | **FIGURE C-4**




| Zone | qt / N | Soil Behavior Type |
|---|---|---|
| 1 | 2 | sensitive fine grained |
| 2 | 1 | organic material |
| 3 | 1 | clay |
| 4 | 1.5 | silty clay to clay |
| 5 | 2 | clayey silt to silty clay |
| 6 | 2.5 | sandy silt to clayey silt |
| 7 | 3 | silty sand to sandy silt |
| 8 | 4 | sand to silty sand |
| 9 | 5 | sand |
| 10 | 6 | gravelly sand to sand |
| 11 | 1 | very stiff fine grained * |
| 12 | 2 | sand to clayey sand * |

* overconsolidated or cemented

$$Rf = \left(\frac{fs}{qt}\right) \cdot 100\%$$

Source: Robertson and Campanella, 2009 & 2010

| | | |
|---|---|---|
| MURRAY ENGINEERS INC GEOTECHNICAL SERVICES | BURLINGAME COMMUNITY CENTER<br>850 BURLINGAME AVENUE<br>BURLINGAME, CALIFORNIA | KEY TO SOIL BEHAVIOR TYPES |
| | PROJECT NO. 3053-1R1 / JULY 2018 | FIGURE C-5 |

## APPENDIX D

## LABORATORY TESTS

Samples from the subsurface exploration were selected for tests to establish the physical and engineering properties of the soils. The tests performed are briefly described below.

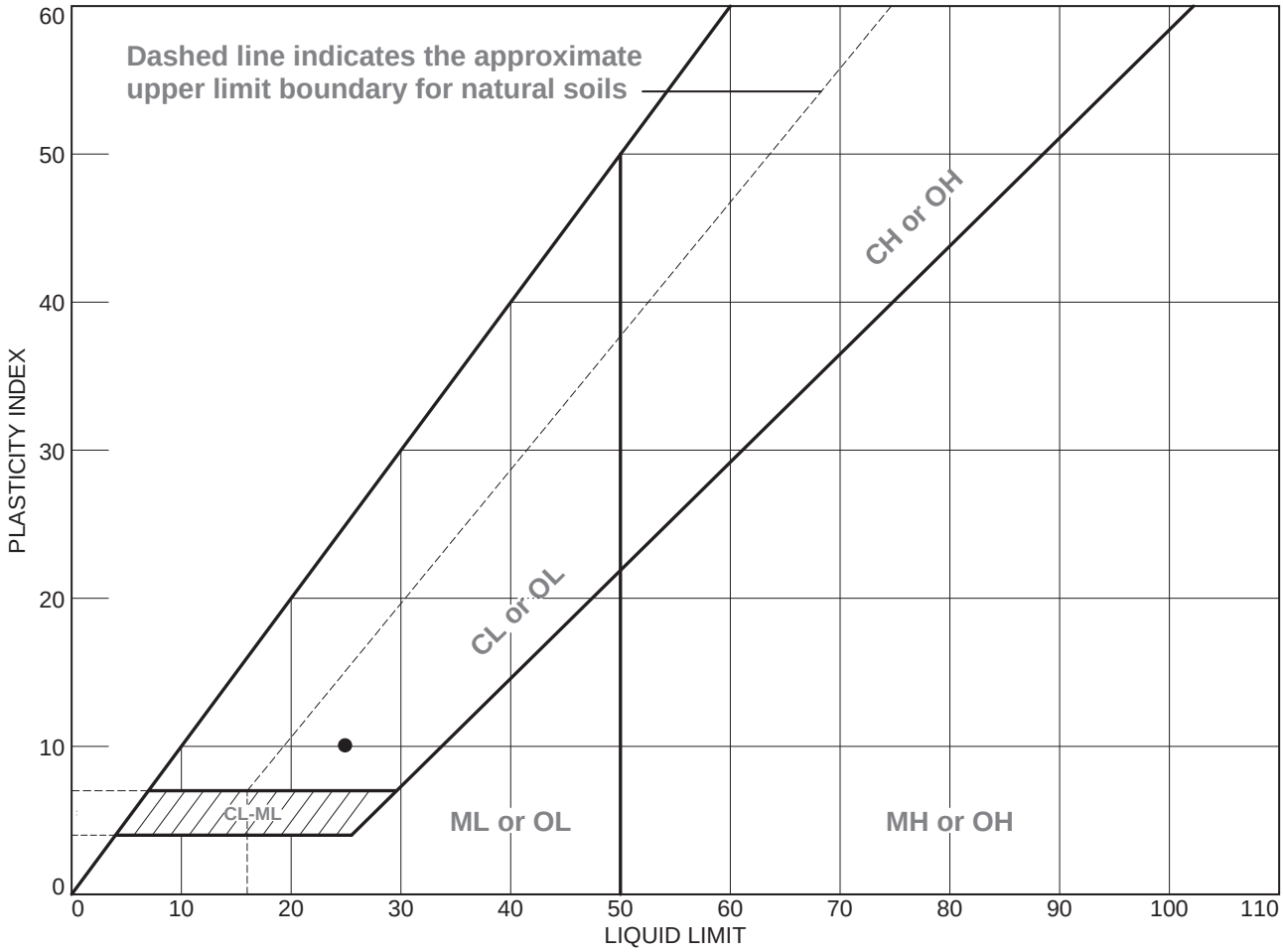
The natural moisture content was determined on most samples and dry density on select samples recovered from the soil boring in accordance with ASTM D 2216 After drying, the weight of each sample was obtained to determine the moisture content representative of field conditions and time the samples were collected. The results are presented on the boring logs at the appropriate sample depths.

The Atterberg Limits were determined on one sample in accordance with ASTM D 4318. The Atterberg Limits are the moisture content within which the soil is workable or plastic. The results of this test are presented in Figure D-1 and on the boring log at the appropriate sample depth.

Staged Consolidated Undrained Triaxial testing was performed by Cooper Testing Laboratory on one sample in accordance with ASTM D4767m and the results of this testing are presented as Figure D-2 and on the boring log, at the appropriate sample depth.

Unconsolidated-Undrained Triaxial testing was performed by Cooper Testing Laboratory on four samples in accordance with ASTM D2850. This test measures the stress versus strain relationship of the soil. The results of this test are presented in Figure D-3.

# LIQUID AND PLASTIC LIMITS TEST REPORT




**SOIL DATA**

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH | NATURAL WATER CONTENT (%) | PLASTIC LIMIT (%) | LIQUID LIMIT (%) | PLASTICITY INDEX (%) | USCS |
|---|---|---|---|---|---|---|---|---|
| ● | B-2 | 1 | 0.5-2' | 15.0 | 15 | 25 | 10 | CL |

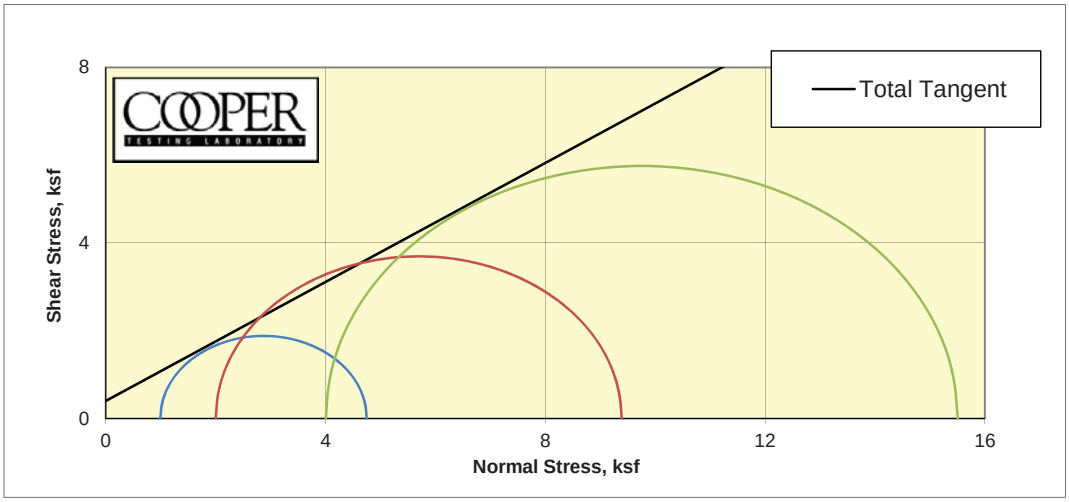
MURRAY ENGINEERS INC
GEOTECHNICAL SERVICES

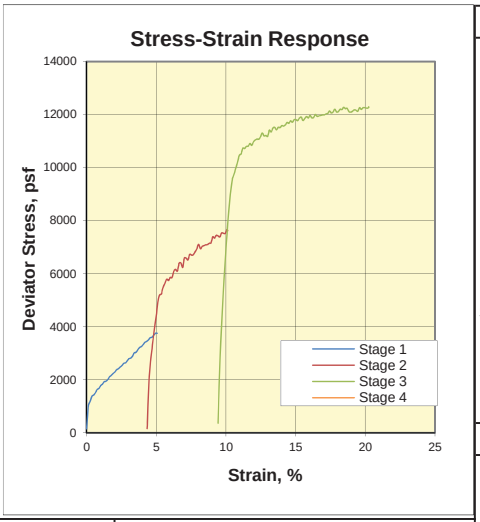
BURLINGAME COMMUNITY CENTER
850 BURLINGAME AVENUE
BURLINGAME, CALIFORNIA

LIQUID & PLASTIC LIMITS TEST REPORT

PROJECT NO. 3053-1R1 | JULY 2018 | FIGURE D-1

Staged Consolidated Undrained Triaxial Compression
ASTM D4767m




| | | | |
|---|---|---|---|
| CTL Number: | 560-236 | | |
| Client Name: | Murray Engineers | | |
| Project Name: | BG Community Center | | |
| Project Number: | P7976 | | |
| Date: | 6/29/2018 | By: | MD/DC |
| Total C | 0.400 | ksf | |
| Total phi | 34.1 | degrees | |
| Eff. C | N/A | ksf | |
| Eff. Phi | N/A | degrees | © |

| Stage | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Boring | B-1 | | | |
| Sample | 1 | | | |
| Depth | 8.5-10 | | | |
| Visual Description | Yellowish Brown Clayey SAND w/ Gravel | | | |
| MC (%) | 10.7 | | | |
| Dry Density (pcf) | 115.9 | | | |
| Saturation (%) | 60.8 | | | |
| Void Ratio | 0.482 | | | |
| Diameter (in) | 1.87 | | | |
| Height (in) | 4.00 | | | |
| | Final | | | |
| MC (%) | 16.3 | 15.7 | 15.1 | |
| Dry Density (pcf) | 118.4 | 119.8 | 121.3 | |
| Saturation (%) | 100.0 | 100.0 | 100.0 | |
| Void Ratio | 0.449 | 0.433 | 0.415 | |
| Diameter (in) | 1.86 | 1.89 | 1.93 | |
| Height (in) | 3.95 | 3.78 | 3.58 | |
| Cell Pressure (psi) | 55.4 | 62.4 | 76.3 | |
| Back Pressure (psi) | 48.5 | 48.5 | 48.5 | |
| | Total Stresses At: | | | |
| Strain (%) | 5.0 | 5.0 | 5.0 | |
| Deviator (ksf) | 3.758 | 7.389 | 11.503 | |
| Excess PP (psi) | | | | |
| Sigma 1 (ksf) | 4.752 | 9.391 | 15.507 | |
| Sigma 3 (ksf) | 0.994 | 2.002 | 4.003 | |
| P (ksf) | 2.873 | 5.696 | 9.755 | |
| Q (ksf) | 1.879 | 3.695 | 5.752 | |
| Stress Ratio | 4.782 | 4.692 | 3.874 | |
| Rate (in/min) | 0.0200 | 0.0199 | 0.0197 | |

MURRAY ENGINEERS INC
GEOTECHNICAL SERVICES

BURLINGAME COMMUNITY CENTER
850 BURLINGAME AVENUE
BURLINGAME, CALIFORNIA

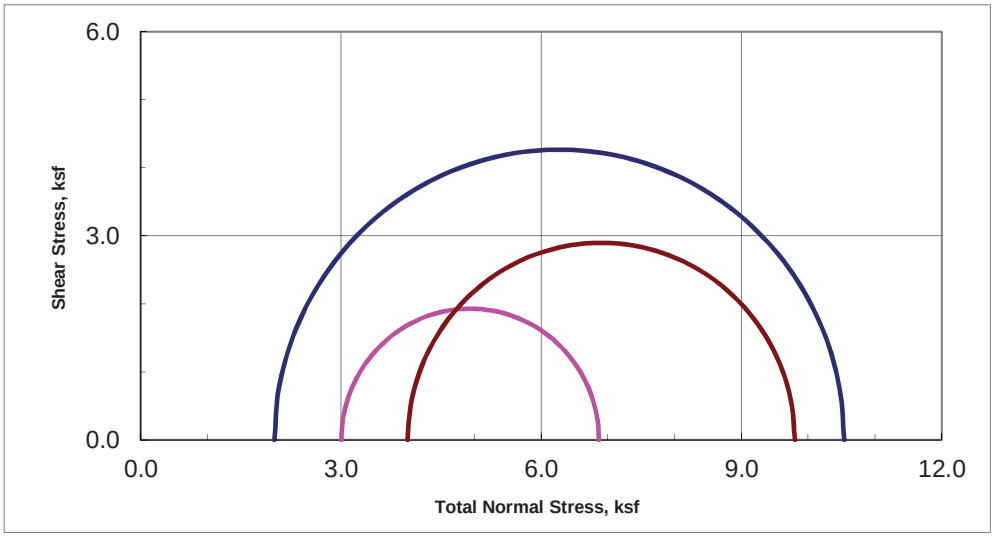
CONSOLIDATED-UNDRAINED TRIAXIAL TEST REPORT

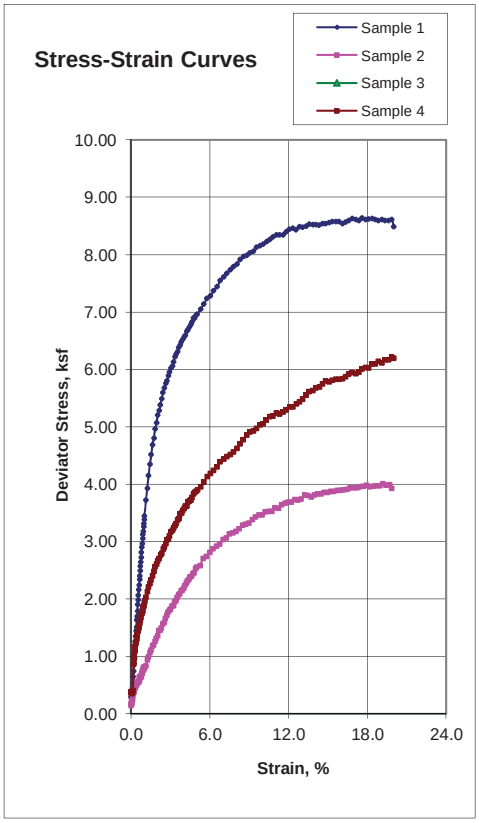
PROJECT NO. 3053-1R1 | JULY 2018 | FIGURE D-2

COOPER TESTING LABORATORY

# Unconsolidated-Undrained Triaxial Test

ASTM D2850




| Sample Data | | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Moisture % | 19.0 | 23.7 | 17.7 | 16.9 |
| Dry Den,pcf | 111.2 | 103.8 | 114.7 | 116.7 |
| Void Ratio | 0.543 | 0.654 | 0.497 | 0.472 |
| Saturation % | 96.1 | 99.6 | 97.8 | 98.5 |
| Height in | 4.01 | 4.02 | 4.00 | 4.00 |
| Diameter in | 1.91 | 1.92 | 1.92 | 1.92 |
| Cell psi | 13.9 | 20.9 | | 27.8 |
| Strain % | 15.00 | 15.00 | | 15.00 |
| Deviator, ksf | 8.536 | 3.862 | | 5.800 |
| Rate %/min | 1.00 | 0.99 | | 1.00 |
| in/min | 0.040 | 0.040 | | 0.040 |
| Job No.: | 560-236 | | | |
| Client: | Murray Engineers | | | |
| Project: | BG Community Center - P7976 | | | |
| Boring: | B-1 | B-1 | B-2 | B-2 |
| Sample: | 1 | 1 | 1 | 1 |
| Depth ft: | 18.5-20 | 28.5-30 | 13.5-15 | 33.5-35 |

| Visual Soil Description | |
|---|---|
| Sample # | |
| 1 | Yellowish Brown Clayey SAND |
| 2 | Yellowish Brown Sandy CLAY |
| 3 | Yellowish Brown Clayey SAND w/ Gravel |
| 4 | Yellowish Brown Clayey SAND w/ Gravel |

On Sample 3, the membrane was punctured by a piece of gravel during the test. No strength data reported.

Note: Strengths are picked at the peak deviator stress or 15% strain which ever occurs first per ASTM D2850.

MURRAY ENGINEERS INC GEOTECHNICAL SERVICES

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UNCONSOLIDATED UNDRAINED TRIAXIAL TEST REPORT

PROJECT NO. 3053-1R1 | JULY 2018 | FIGURE D-3