### COUNTY OF SAN MATEO PLANNING AND BUILDING

May 28, 2021

**County Government Center** 

455 County Center, 2nd Floor Redwood City, CA 94063 650-363-4161 T planning.smcgov.org

Jen Jacinto 303 Twin Dolphin Drive Redwood City, CA 94065

Dear Ms. Jacinto:

SUBJECT: Coastside Design Review Continuance

1120 Columbus Drive, El Granada

APN 047-275-050; County File No. PLN 2017-00296

The San Mateo County Coastside Design Review Committee (CDRC) considered this proposed Major Modification at its November 14, 2019 and February 11, 2021 meetings where it was subsequently continued to further amend the project plans and provide additional information.

At its May 13, 2021 meeting, the CDRC considered the subject application for a Design Review Permit to allow a Major Modification (Modification) to a 2,428 sq. ft. new residence on a 6,026 sq. ft. legal parcel previously recommended for approval by the CDRC on February 8, 2018 and approved along with the associated staff-level Grading Permit by the Planning Department on March 2, 2018. The proposed Modification addresses project changes made during construction and includes raising the rear yard ground elevation 4 to 6 feet involving an additional 240 cubic yards (cy) of grading (fill only), modifications to the second-story balcony and first story deck, garage and entry doors, stone siding, railings, landscape plan, and the addition of exterior stairs to the right side of the residence among other changes. This project qualifies for a Coastal Development Permit Exemption and is not appealable to the California Coastal Commission. Due to proposed modifications to the associated staff-level Grading Permit, the CDRC will not render a decision, but will make a recommendation regarding the project's compliance with the Design Review Standards.

At its May 13, 2021 meeting, the CDRC was unable to make the findings for a design review recommendation of approval based on certain plan discrepancies. In order to resolve these deficiencies in the project's design, a more thorough review of the "Standards for Design for One-Family and Two-Family Residential Development in the Midcoast" manual as well as modified plans are required. As such, requirements from the CDRC for further project redesign are as follows:



### 1. Recommendations:

- a. Revise the landscape plan to include terracing and shrubs in the backyard area. Consider adding a retaining wall to the backyard area as well as shrubs to the sides of the house along the right and left elevations. See Section 6565.20(F); 1. Landscaping; Standards b, e, and g.
- Refinish the slope in the backyard so that it is the same as the finished grade for the house and to ensure that the concrete landing is flush with the finished grade.
   See Section 6565.20(C); 1. Integrate Structures with Natural Setting; b. Grading; Standard 4.
- c. Remove the exterior stairs from the right side of the house. See Section 6565.20(F); 3. Fencing; Standard.
- d. Provide more variety in colors and materials for the exterior of the house, including an additional contrast color, ornamentation, and/or different material. See Section 6565.20(D); 4. Exterior Materials and Colors; Standards; c. Quantity (2,3), d. Ornamentation.
- e. Provide more facade articulation for the right side of the house. The existing stone siding would more successfully address this guideline if it were deployed more consistently, including on the side facades. See Section 6565.20(D); 4. Exterior Materials and Colors; Standards; c. Quantity (2,3), d. and Section 6565.20(D); 1. Building Mass, Shape, and Scale; d. Facade Articulation option.
- f. Clarify the position and function of the gas meter box, the standing 4x4 posts, and the PVC drain pipe in the front left side of the parcel. Ensure that this structure is included and described in the plan set.
- g. Add a railing to the cement landing at the back of the house.
- h. Remove the electrical plates from the front of the garage and the second-story deck area.

As such, you were presented with the following available options at the end of the CDRC's deliberation of the project: (1) request for a decision from the CDRC on the plans presented or (2) request that the project be considered at a future meeting to provide you time to consider and incorporate the elements recommended for project redesign. You chose the second option, and the CDRC directed staff to schedule your project for consideration at a later date.

Please contact Laura Richstone, Project Planner, at 650/722-1044 or <a href="mailto:lrichstone@smcgov.org">lrichstone@smcgov.org</a>, if you have any questions.

To provide feedback, please visit the Department's Customer Survey at the following link: <a href="http://planning.smcgov.org/survey">http://planning.smcgov.org/survey</a>.

Sincerely,

Ruemel S. Panglao Design Review Officer

RSP:LAR:agv – LARFF0656\_WAN.DOCX

cc: Ladan Abolmoluki, Owner

Katie Kostiuk, Member Architect Rebecca Katkin, Member Architect

Chris Johnson, El Granada Community Representative

### RDS/RESIDENTIAL DESIGN SOLUTIONS

406 La Jolla Avenue San Mateo, CA. 94403 (650) 218-8161

Attn: County of San Mateo Planning & Building Date: 7/12/2021

Re: Coastside Design Review Continuance

APN: 047-275-050, County File. No. PLN 2017-00296

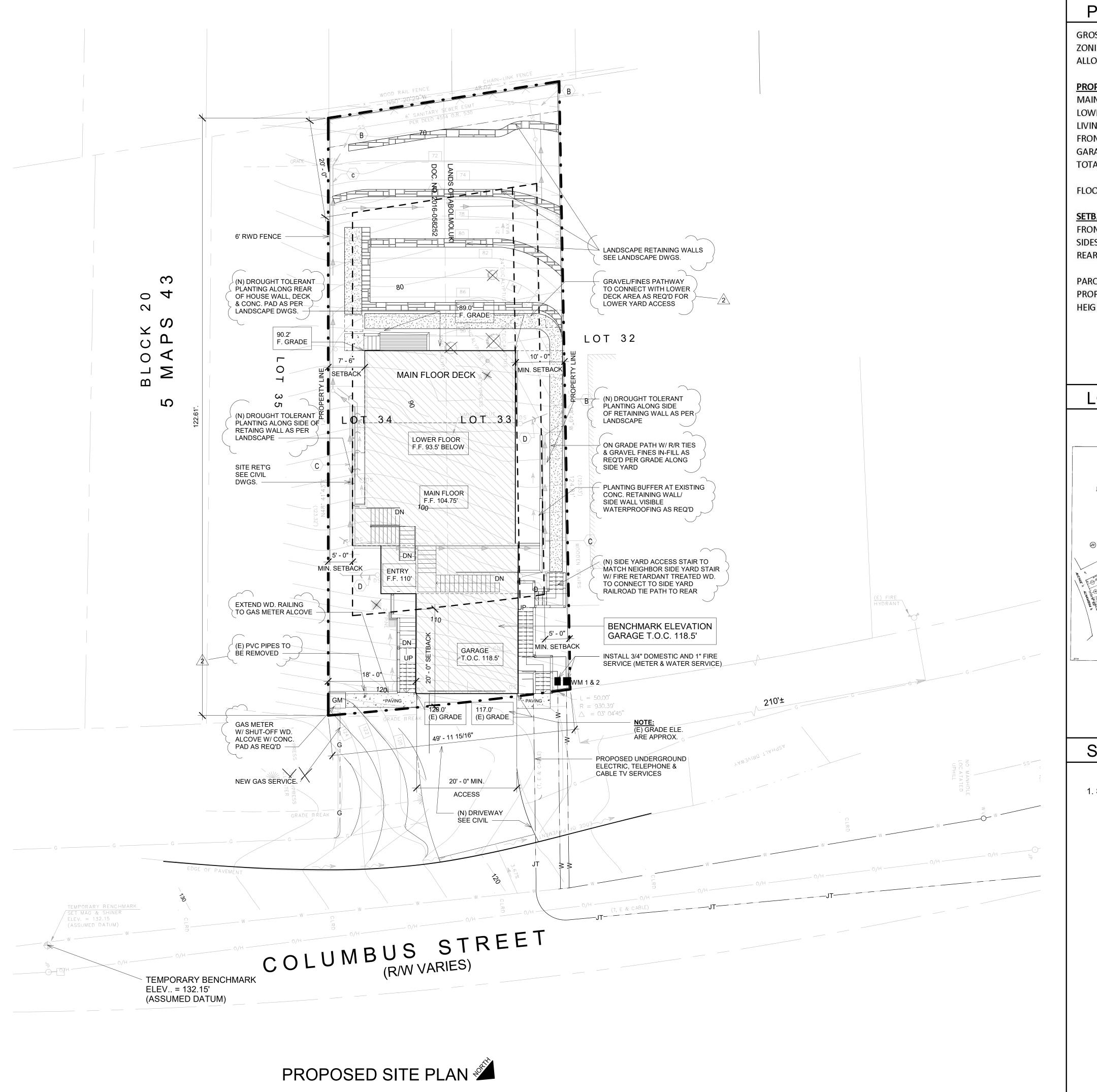
Project Address: 1120 Columbus Drive, El Granada

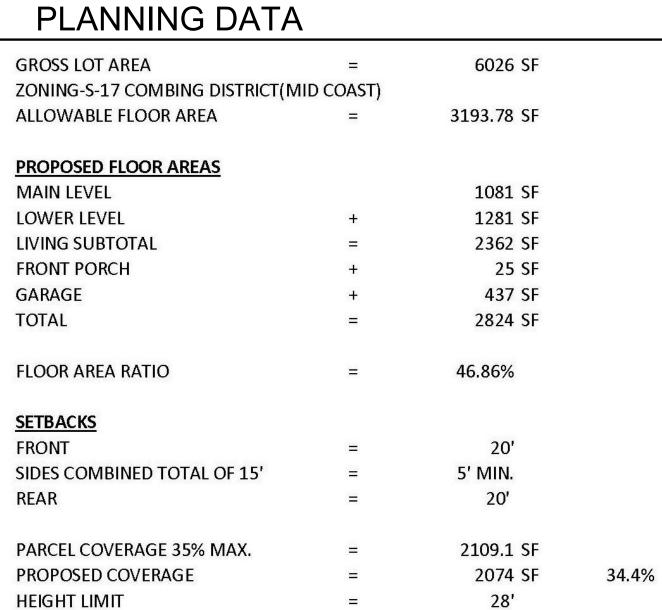
To whom it may concern,

In response to Coastside Design Review letter dated 5/28/2021. Revised plans are noted delta 2 and the revision is dated 6/20/21.

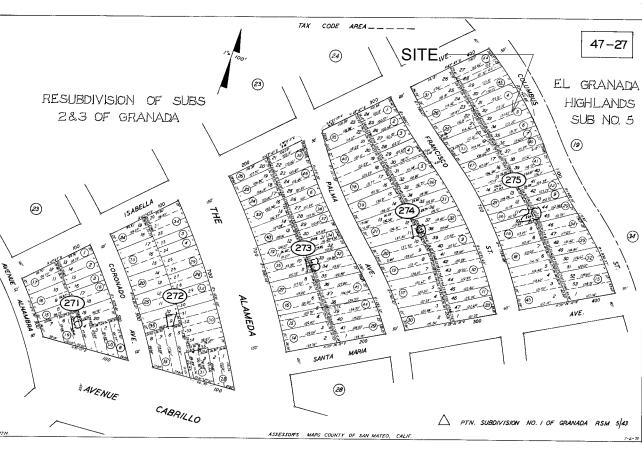
### 1. Recommendations

- a. Landscape plans revised. See plans for additional information.
- b. Please note additional planting is proposed for the rear of the house. Please note a walking/access path is proposed for the rear area at the deck off the lower bedroom. See also landscape plans.
- c. Please note the Owner wishes to keep the side stair as property access to the right side and rear yard areas. The proposal is to add a new section of stair from the lower side deck down to grade, so it may connect to a proposed railroad tie and granite fines walkway that will allow access the rear yard area. Please note the right-side neighbor also has a wood stair in the side yard area. See sheet A1 & A7.
- d. Please note a contrasting, white colored, prefinished plaster belly band trim was added to the left, right and rear portions of the house. See A5.0, A5.1, A6 & A7. See also sheet A8 for rear roof awning detail.
- e. Please note the stone veneer at the front of the house is to be continued up to roof rake trim.
- f. Please note the front yard gas meter condition is addressed on sheet A1.
- g. Please note it is not anticipated that a railing shall be needed at the lower deck landing area.
- h. Please note the plastic cover plate visible at the front of the house, above the garage door, will be removed.





### **LOCATION MAP**



### SITE PLAN NOTES

1. SEE CIVIL DRAWINGS FOR ALL SITE GRADING ETC. TYPICAL.



**406 LA JOLLA AVENUE** SAN MATEO, CA 94403 (650) 218-8161 EMAIL RDS@CHRISTIANRUFFAT.COM CHRISTIANRUFFAT.COM



### NEW RESIDENCE 1120 COLUMBUS DR. EL GRANADA, CA. APN.047-275-050

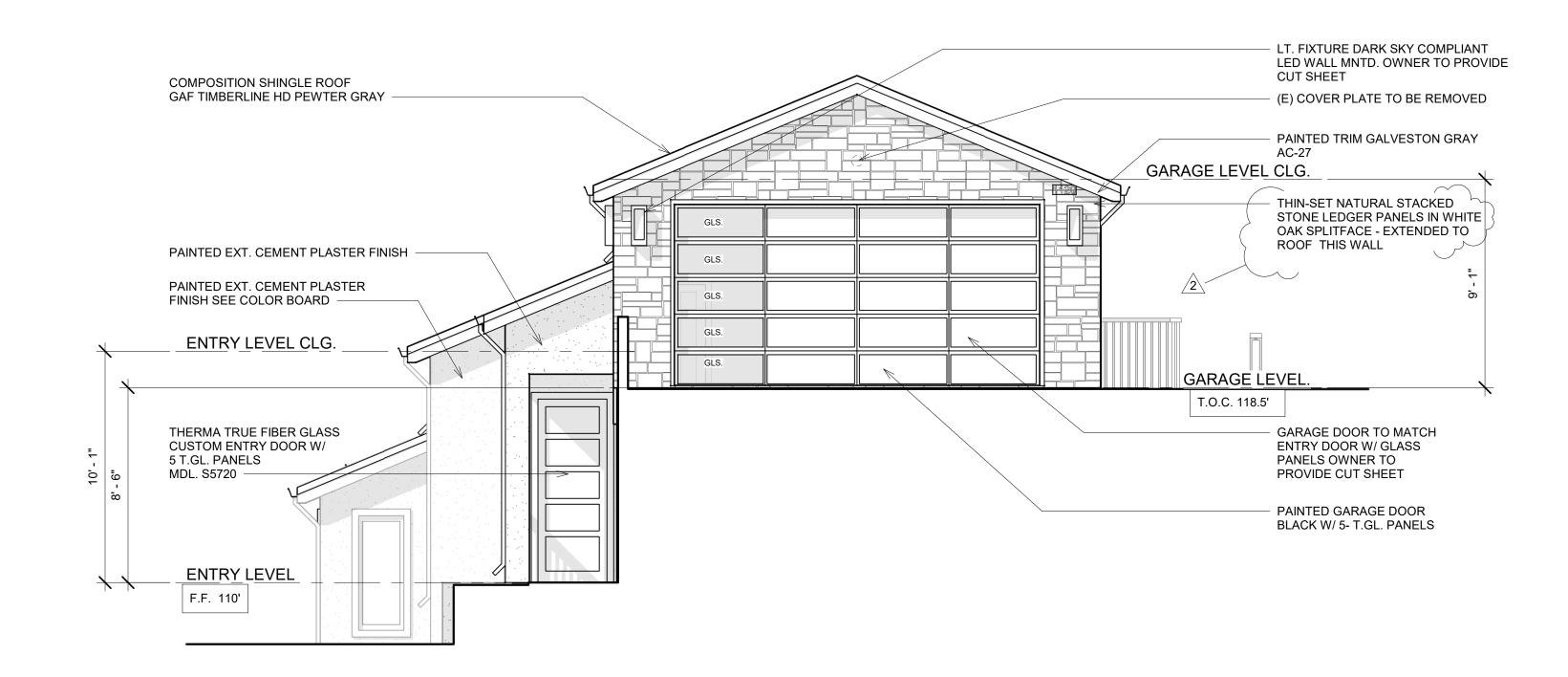
-DESIGN REVIEW RESUBMITTAL-V1

DESCRIPTION	DATE	BY
1 PLANNING RESUBMITTAL	3-2-2021	CR
2 PLANNING RESPONSES	6-20-2021	CR
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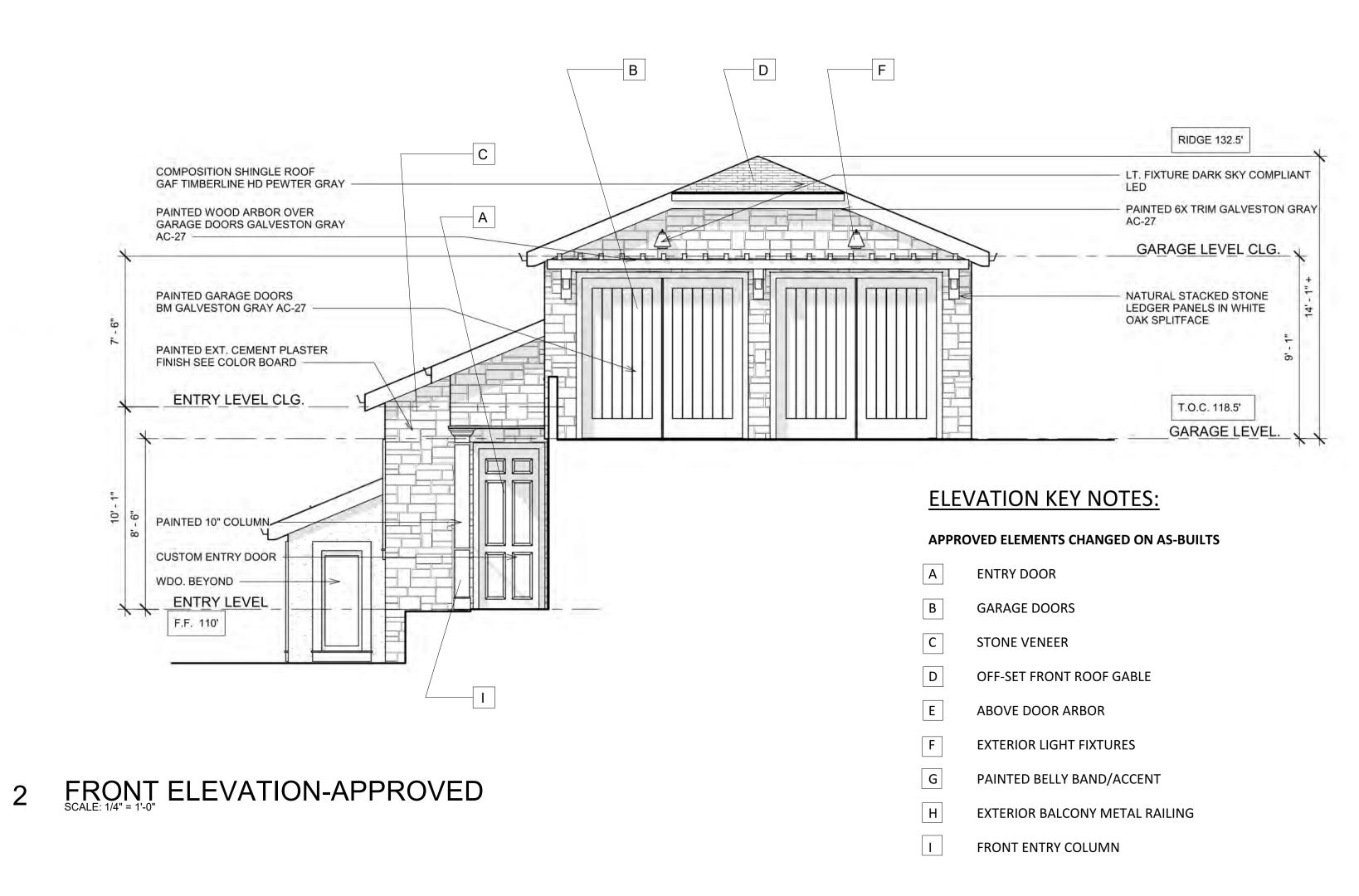
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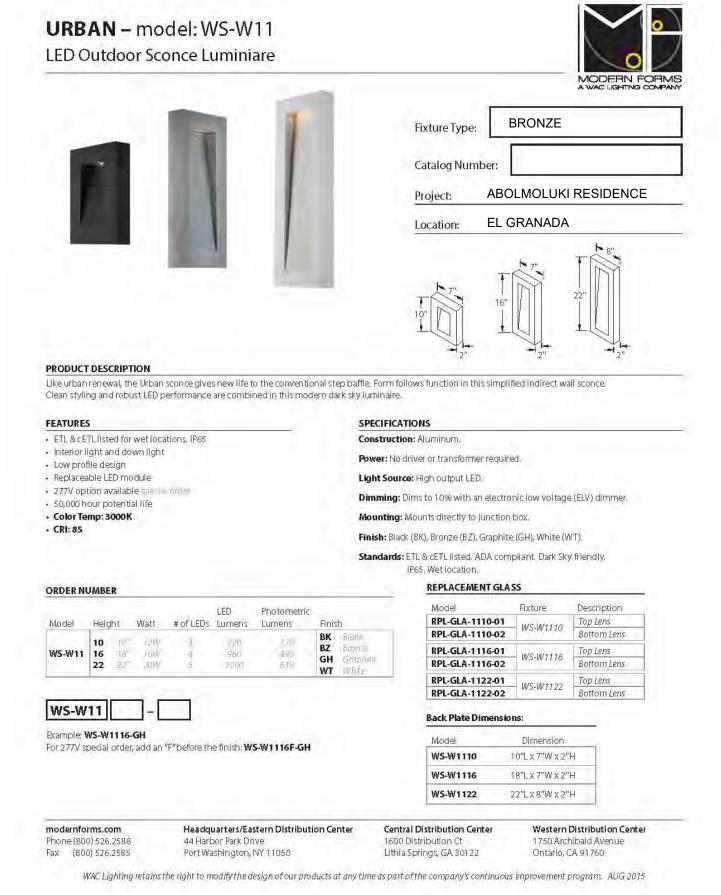
Drawing Number DATE 6/20/2021

Scale 1" = 10'-0"



### FRONT ELEVATION-AS BUILT





### LIGHT FIXTURE CUT SHEET

Capital Lighting - 9092RI-GD - Outdoor Dark Sky-Energy Saver One Light Wall Lantern in Mediterranean Bronze SKU#: 9092RI-GD Availability: In Stock

Capital Lighting - 9092R1-GD - Ontdoor Dark Sky-Energy Saver One Light Wall Lantem in Mediterranean Bronze

Retail Price: \$145,00 Your Savings: \$29.00. Your Price: \$116.00

Quantity 1



Tell a Friend Add to Gift Registry

- Wall lanterm Outdoor sollection
- Mediterranean Bronze linish
- Acid washed glass lone shade Traditional style
- UL listed for wet locations Dark sky
- Energy saver ► Eco Handly

### Spacifications:

- Accommodates (1) 18W GU24 (horrescent base builb (included)
- Backplate dimensions: 7.54" H x 5.71" W x 1.1" D
- Overall dimensions: B 25" H x 10" W x 11" D.



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-DESIGN REVIEW RESUBMITTAL-V1

		DESCRIPTION	DATE	BY
	1	PLANNING RESUBMITTAL	3-2-2021	CR
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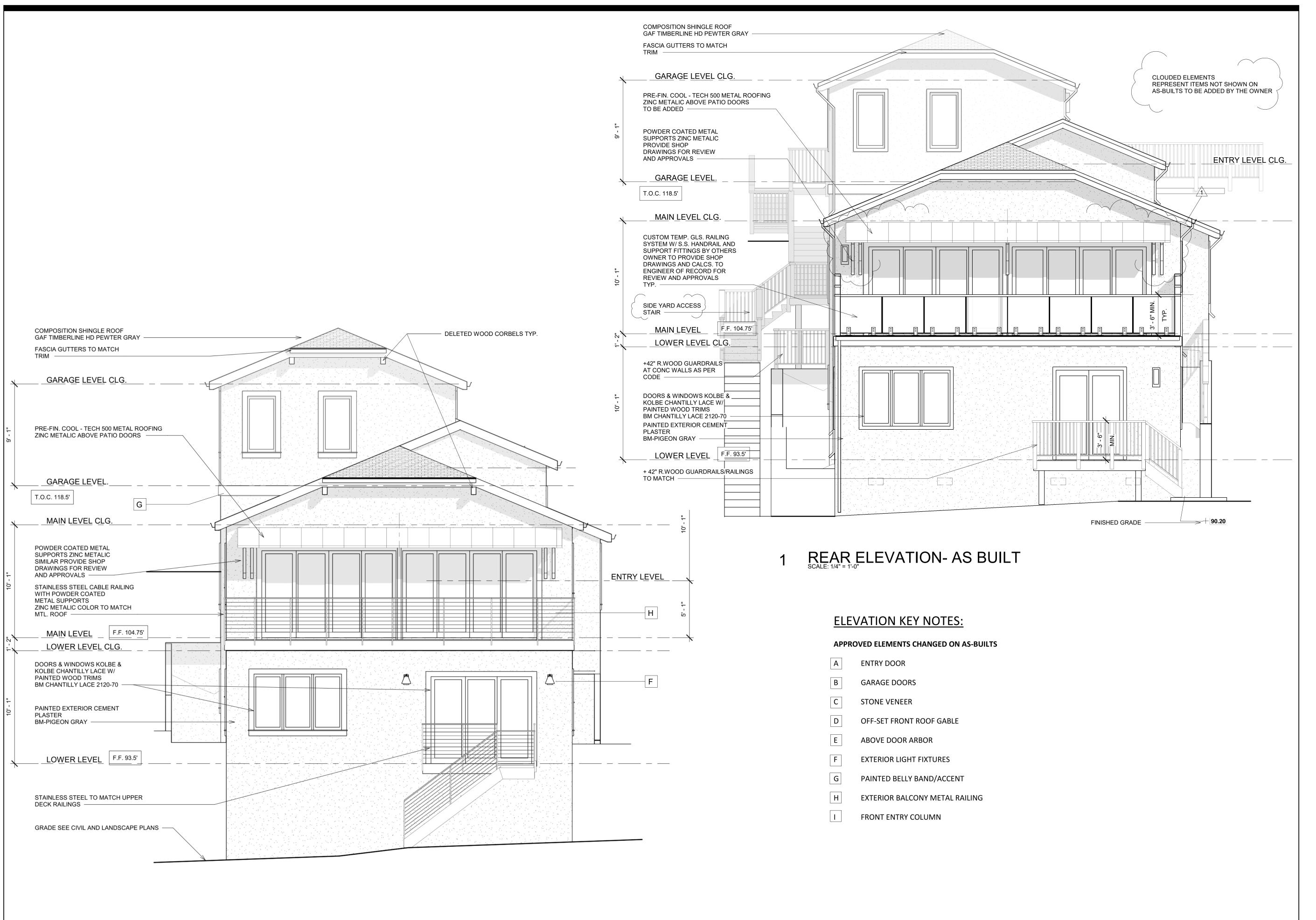
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DATE **Drawing Number** 

Scale As indicated

6/20/2021

A5.0



REAR ELEVATION-APPROVED



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## NEW RESIDENCE 1120 COLUMBUS DR. EL GRANADA, CA. APN.047-275-050

-DESIGN REVIEW RESUBMITTAL-V1

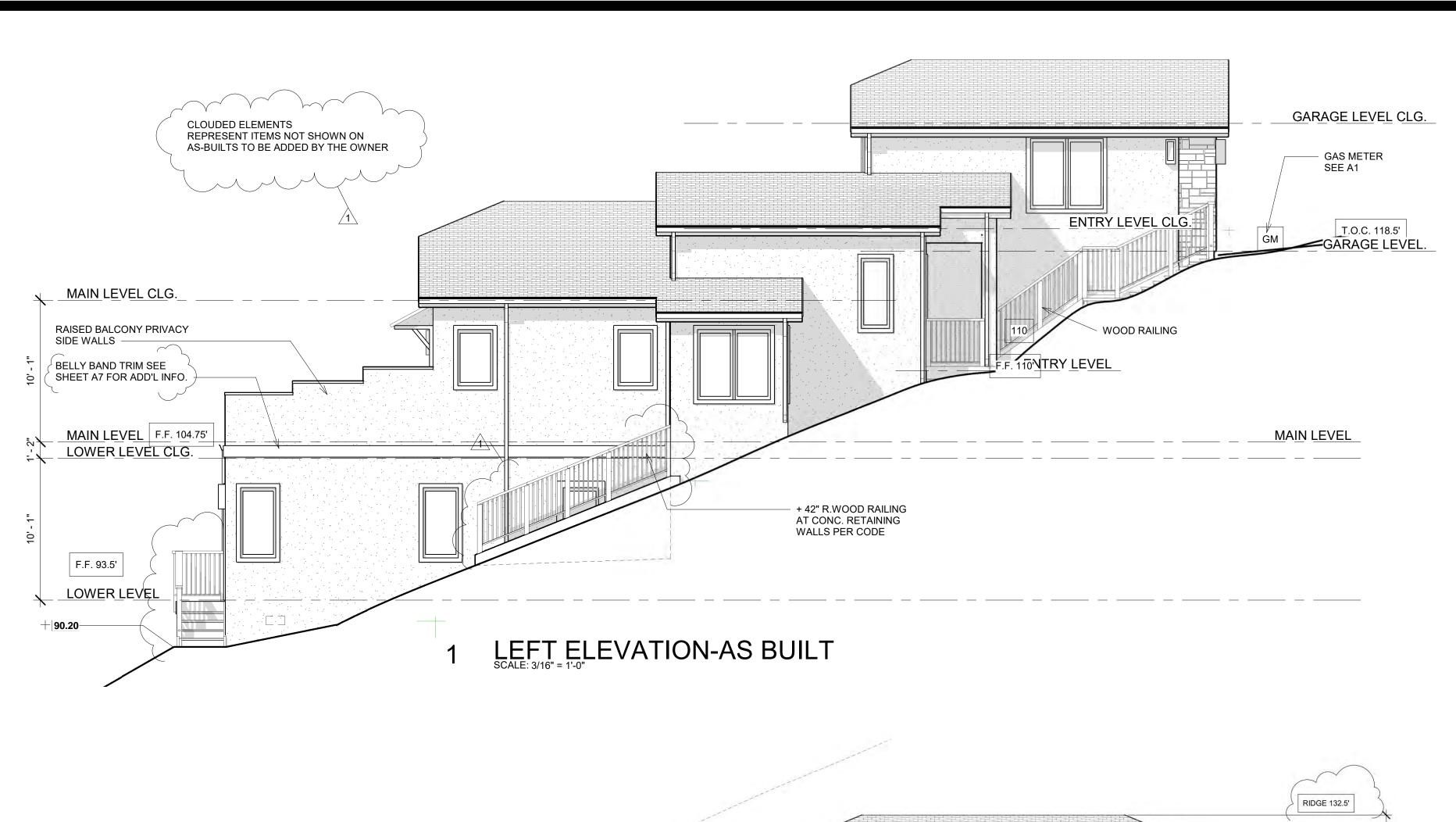
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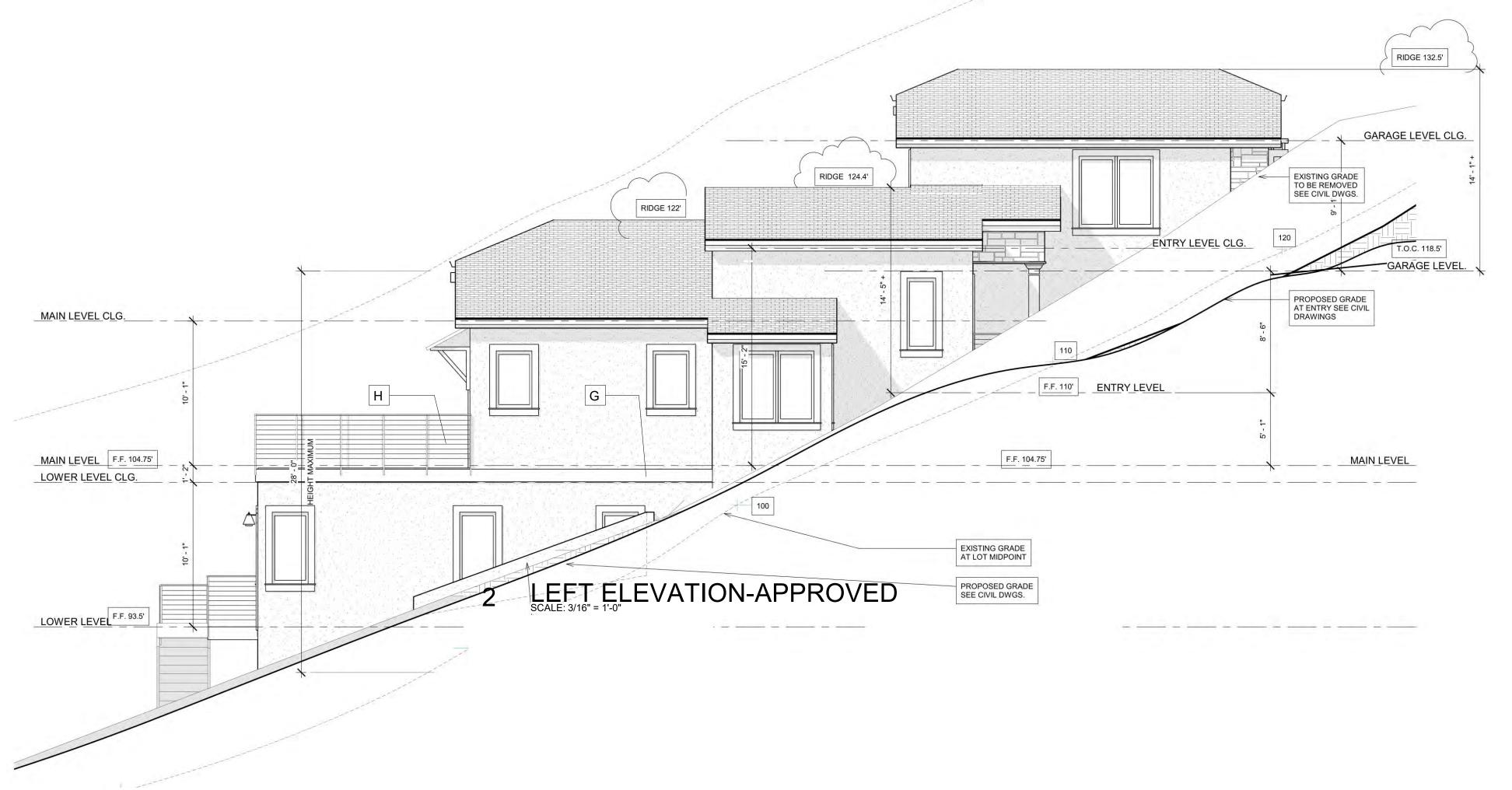
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DATE Drawing Number
6/20/2021

Scale
As indicated

A5.1





### RESIDENTIAL **DESIGN SOLUTIONS** 406 LA JOLLA AVENUE

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### NEW RESIDENCE 1120 COLUMBUS DR. EL GRANADA, CA. APN.047-275-050

-DESIGN REVIEW RESUBMITTAL-V1

		DESCRIPTION	DATE	BY
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Drawing Number DATE

Scale 3/16" = 1'-0"

**ELEVATION KEY NOTES:** 

**ENTRY DOOR** 

**GARAGE DOORS** 

STONE VENEER

Α

APPROVED ELEMENTS CHANGED ON AS-BUILTS

OFF-SET FRONT ROOF GABLE

EXTERIOR LIGHT FIXTURES

FRONT ENTRY COLUMN

PAINTED BELLY BAND/ACCENT

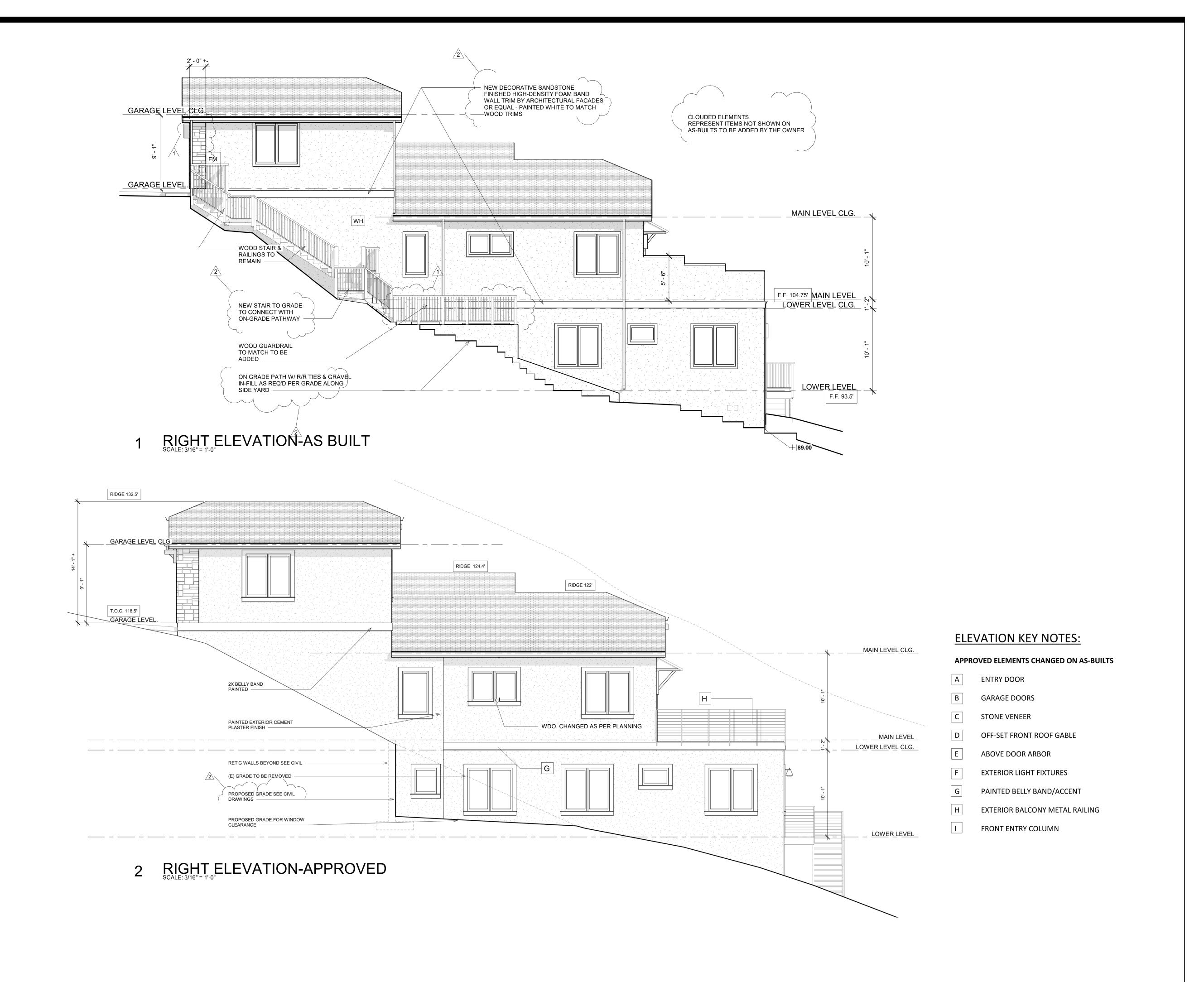
EXTERIOR BALCONY METAL RAILING

ABOVE DOOR ARBOR

**A6** 

Project Number

6/20/2021





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(650) 218-8161
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-DESIGN REVIEW RESUBMITTAL-V1

		DESCRIPTION	DATE	BY
	1	PLANNING RESUBMITTAL	3-2-2021	CR
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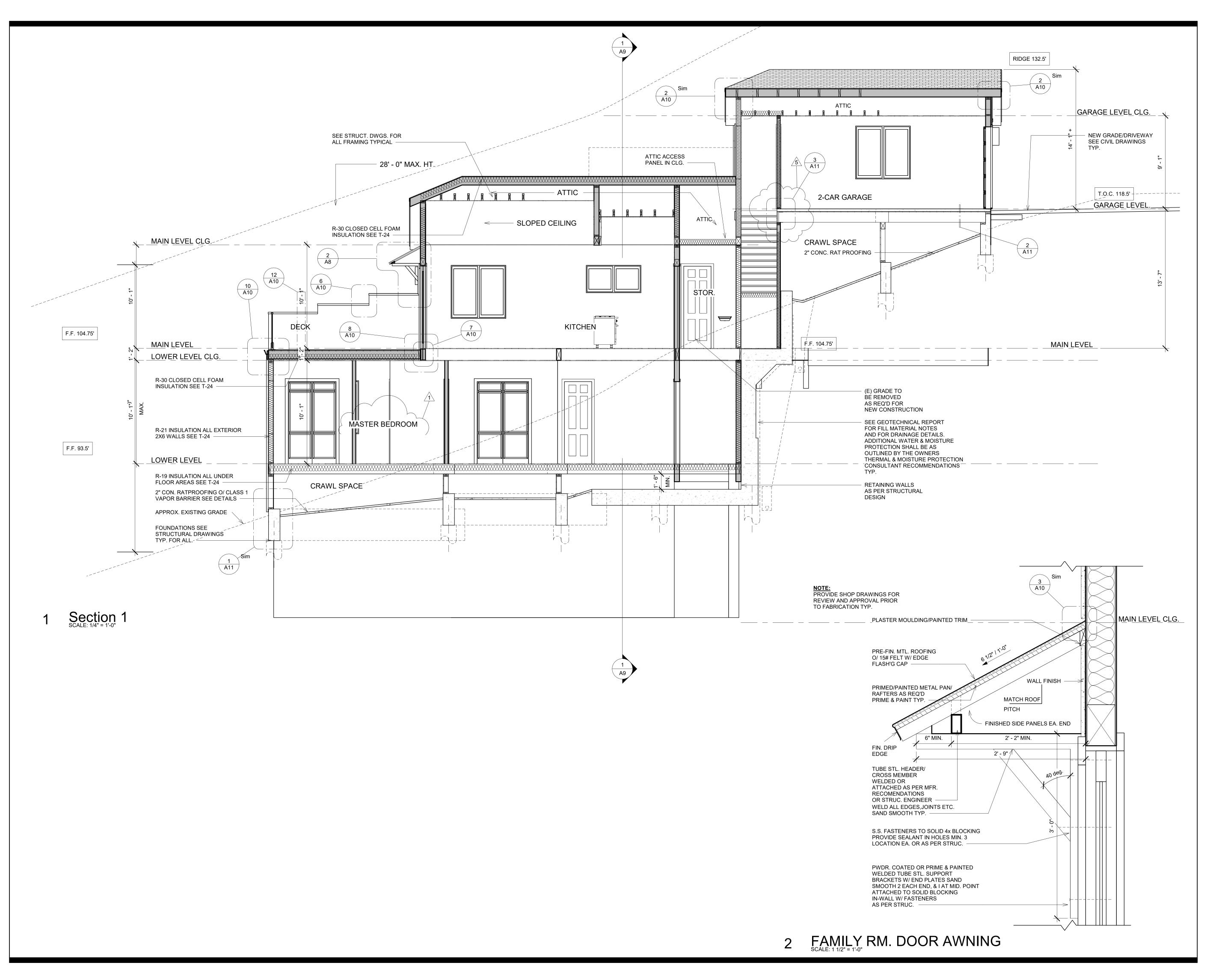
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DATE 6/20/2021

Drawing Number

Scale 3/16" = 1'-0"

**A7** 





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## NEW RESIDENCE 1120 COLUMBUS DR. EL GRANADA, CA. APN.047-275-050

-DESIGN REVIEW RESUBMITTAL-V1

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DATE Drawing Number
6/20/2021

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**A**8

MAINTENANCE DURING THE WARRANTY PERIOD by the plant installer During the warranty period, provide all maintenance for all plantings to keep the plants in a healthy state and the planting areas clean and neat. General requirements:

- All work shall be undertaken by trained planting crews under the supervision of a foreman with a minimum of 5 years experience supervising commercial plant maintenance crews.
   All chemical and fertilizer applications shall be made by licensed applicators for the type of
- provincial and federal requirements.
  3. Assure that hoses and watering equipment and other maintenance equipment does not block paths or be placed in a manner that may create tripping hazards. Use standard safety warning harriers and other procedures to maintain the site in a safe manner for vicitors at

chemicals to be used. All work and chemical use shall comply with all applicable local,

- warning barriers and other procedures to maintain the site in a safe manner for visitors at all times.

  4. All workers shall wear required safety equipment and apparel appropriate for the tasks
- being undertaken.The Contractor shall not store maintenance equipment at the site at times when they are
- not in use unless authorized in writing by the Owner's Representative.

  6. Maintenance vehicles shall not park on the site including walks and lawn areas at any time
- without the Owner's Representative's written permission.
- 7. Maintain a detailed log of all maintenance activities including types of tasks, date of task, types and quantities of materials and products used, watering times and amounts, and number of each crew. Periodically review the logs with the Owner's Representative, and submit a copy of the logs at the end of each year of the maintenance agreement.
- 8. Meet with the Owner's Representative a minimum of three times a year to review the progress and discuss any changes that are needed in the maintenance program. At the end of the warranty period attend a hand over meeting to formally transfer the responsibilities of maintenance to the Owner's Representative. Provide all information on past maintenance activities and provide a list of critical tasks that will be needed over the next 12 months. Provide all maintenance logs and soil test data. Make the Contractor's supervisor available for a minimum of one year after the end of the warranty period to answer questions about past maintenance.
- 9. Provide the following maintenance tasks:
- 10. Watering; Provide all water required to keep soil within and around the root balls at optimum moisture content for plant growth.
- 11. Maintain all watering systems and equipment and keep them operational.
- 12. Monitor soil moisture to provide sufficient water. Check soil moisture and root ball moisture with a soil moisture meter on a regular basis and record moisture readings. Do not over water.
- 13. Soil nutrient levels: Take a minimum of 4 soil samples from around the site in the spring and fall and have them tested by an accredited agricultural soil testing lab for chemical composition of plant required nutrients, pH, salt and % organic matter. Test results shall include laboratory recommendations for nutrient applications. Apply fertilizers at rates recommended by the soil test.
- 14. Make any other soil test and/or plant tissue test that may be indicated by plant conditions that may not be related to soil nutrient levels such as soil contaminated by other chemicals or lack of chemical uptake by the plant.

- 15. Plant pruning: Remove cross over branching, shorten or remove developing co dominant leaders, dead wood and winter-damaged branches. Unless directed by the Owner's Representative, do not shear plants or make heading cuts.
- 16. Restore plants: Reset any plants that have settled or are leaning as soon as the condition is noticed.
- 17. Guying and staking: Maintain plant guys in a taught position. Remove tree guys and staking after the first full growing season unless directed by Owner's Representative.
- 18. Weed control: Keep all beds free of weeds. Hand-remove all weeds and any plants that do not appear on the planting plan. Chemical weed control is permitted only with the approval
- of the Owner's Representative. Schedule weeding as needed but not less 12 times per year.

  19. Trash removal: Remove all trash and debris from all planting beds and maintain the beds in a neat and tidy appearance. The number of trash and debris removal visits shall be no less than 12 times per year and may coincide with other maintenance visits.
- 20. Plant pest control: Maintain disease, insects and other pests at manageable levels. Manageable levels shall be defined as damage to plants that may be noticeable to a professional but not to the average person. Use least invasive methods to control plant disease and insect outbreaks.
- 21. The Owner's Representative must approve in advance the use of all chemical pesticide applications.
- 22. Plant replacement: Replace all plants that are defective as defined in the warranty provisions, as soon as the plant decline is obvious and in suitable weather and season for planting as outlined in above sections. Plants that become defective during the maintenance period shall be covered and replaced under the warranty provisions.
- 23. Mulch: Refresh mulch once a year to maintain complete coverage but do not over mulch. At no time shall the overall mulch thickness be greater that 3 inches. Do not apply mulch within 6 inches of the trunks or stems of any plants. Replacement mulch shall meet the requirements of the original approved material. Mulch shall be no more than one inch on top of the root ball surface.
- 24. Bed edging: Check and maintain edges between mulch and lawn areas in smooth neat lines as originally shown on the drawings.
- 25. Leaf, fruit and other plant debris removal: Remove fall leaf, spent flowers, fruit and plant part accumulations from beds and paved surfaces. Maintain all surface water drains free of debris. Debris removal shall be undertaken at each visit to weed or pick up trash in beds.
- 26. Damage from site use: Repair of damage by site visitors and events, beyond normal wear, are not part of this maintenance. The Owner's Representative may request that the Contractor repair damage beds or plantings for an additional cost. All additional work shall be approved in advance by the Owner's Representative.

### PLANT SCHEDULE

TREES	CODE	QTY	BOTANICAL / COMMON NAME	CONT		REMARKS
	ARB COM	3	ARBUTUS UNEDO `COMPACTA` / DWARF STRAWBERRY TREE	15 GAL.		WATER USE LOW
	ARC HUR	5	ARCTOSTAPHYLOS MANZANITA `DR. HURD` / DR. HURD MANZANITA	15 GAL.		LOW
	EUC SIL	1	EUCALYPTUS CINEREA / SILVER DOLLAR TREE	15 GAL.		LOW
SHRUBS	CODE	<u>QTY</u>	BOTANICAL / COMMON NAME	CONT		REMARKS
(•)	BAC TWI	6	BACCHARIS PILULARIS 'TWIN PEAKS II' / TWIN PEAKS COYOTE BRUSH	1 GAL		WATER USE LOW
+	CEA VAL	32	CEANOTHUS MARITIMUS 'VALLEY VIOLET' / MARITIME CEANOTHUS	5 GAL		LOW
$\bigcirc$	CEA JUL	1	CEANOTHUS X 'JULIA PHELPS' / CALIFORNIA LILAC	5 GAL		LOW
$\bigcirc$	HET ARB	4	HETEROMELES ARBUTIFOLIA / TOYON	5 GAL		LOW
$\bigcirc$	MYR CAL	14	MYRICA CALIFORNICA / PACIFIC WAX MYRTLE	5 GAL		MEDIUM
£3	WOO FIM	11	WOODWARDIA FIMBRIATA / GIANT CHAIN FERN	1 GAL		MEDIUM
GROUND COVERS	CODE	QTY	BOTANICAL / COMMON NAME	CONT	SPACING	REMARKS
	MYO PAR	182	MYOPORUM PARVIFOLIUM / TRAILING MYOPORUM	1 GAL	36" o.c.	WATER USE LOW
	SAL BEE	8	SALVIA X `BEE`S BLISS` / SAGE	1 GAL	48" o.c.	LOW

70 BW = BOTTOM OF WALL ELEVATION

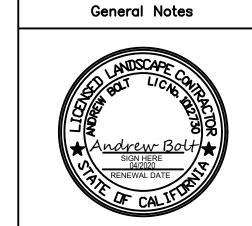
73 TW = TOP OF WALL ELEVATION



DRY STACK WALL. TYPE. WINDSOR WALL ROCK AVAILABLE FROM: LYNGSO GARDEN MATERIALS 650-364-1730 "I HAVE COMPLIED WITH THE LANDSCAPE DESIGN CRITERIA OF THE MODEL WATER EFFICIENT LANDSCAPE ORDINANCE AND APPLIED THEM ACCORDINGLY FOR THE EFFICIENT USE OF WATER IN THIS DESIGN."

DATED: 07/23/2021 BY: Andrew Bolt





PLANTING LAYOUT

No. Revision/Issue Date

Firm Name and Address



Project Name and Address

COLUMBUS ST.

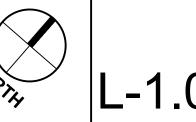
EL GRANADA, CA

Project Drawn By
236-2019 4BInc.

Date Checked By
9/10/19 4BInc.

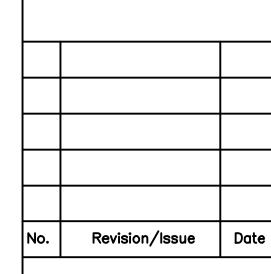
Scale Approved By

1/8"=1'-0" Sheet



General Notes

# PLANTING DETAILS



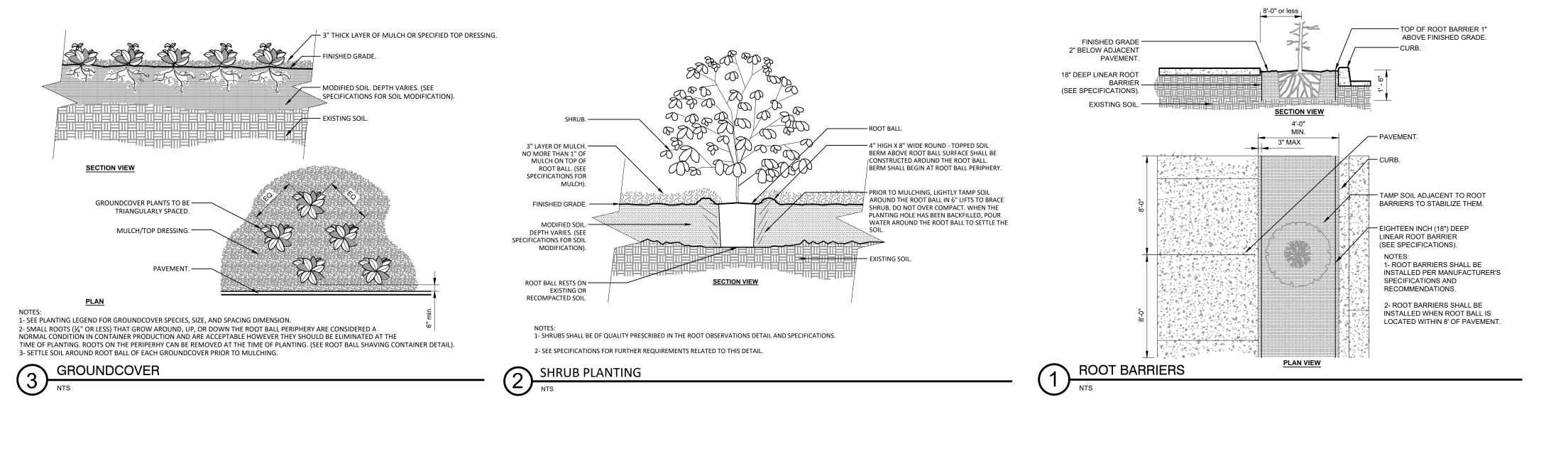


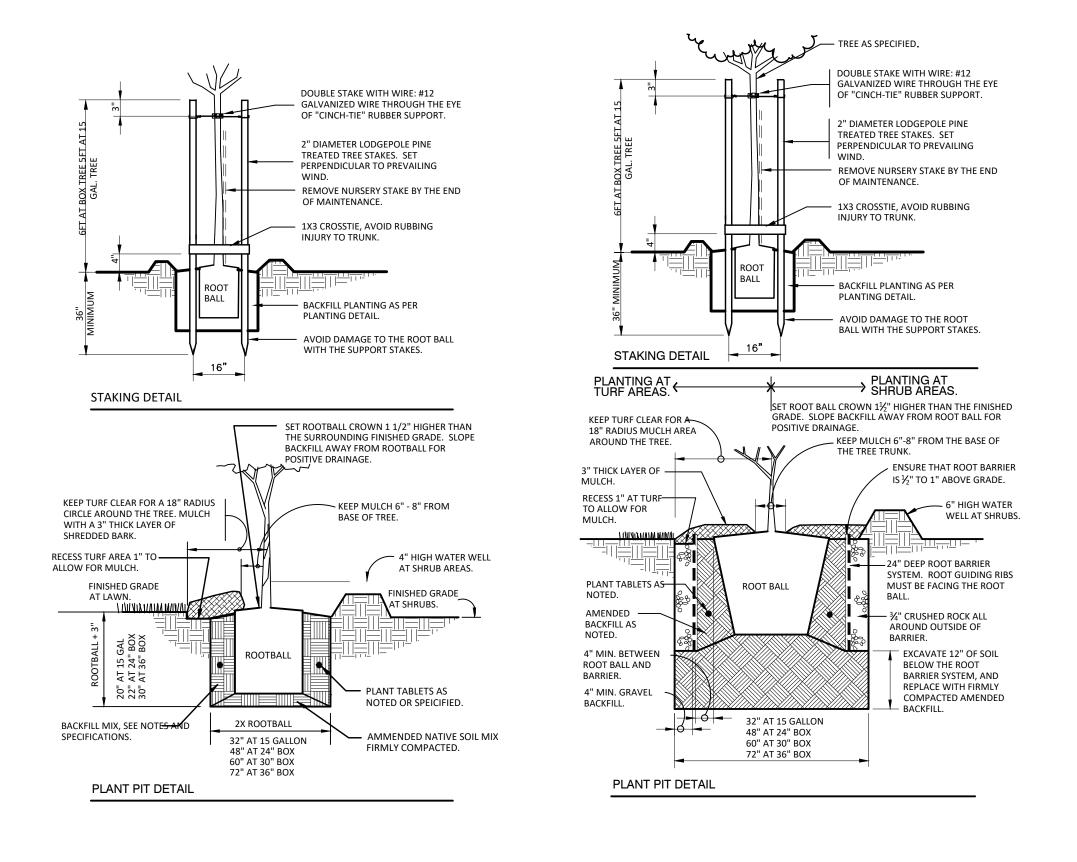
Project Name and Address

COLUMBUS ST.

EL GRANADA, CA

	Drawn By	
236-2019	4BInc.	
Date	Checked By	
9/10/19	4Blnc.	
Scale	Approved By	
	Sheet	





TREE PLANTING DOUBLE STAKE

NTS

ROOT BARRIER TREE PLANTING

1" = 1'-0"



PLANTING

determination if plants meet these specifications or that plants are defective. Plants warranty shall begin on the date of Substantial Completion Acceptance and continue for the following periods,

classed by plant type: a. Trees - 1 Year(s).

b. Shrubs - 1 Year(s) c. Ground cover and perennial flower plants - 1 Year(s).

d. Bulbs, annual flower and seasonal color plants - for the period of expected bloom or primary display

2. When the work is accepted in parts, the warranty periods shall extend from each of the partial Substantial Completion Acceptances to the terminal date of the last warranty period. Thus, all warranty periods for each class of plant warranty, shall terminate at one time.

3. All plants shall be warrantied to meet all the requirements for plant quality at installation in this specification. Defective plants shall be defined as plants not meeting these requirements. The Owner's representative shall make the final determination that plants are defective.

4. Plants determined to be defective shall be removed immediately upon notification by the Owner's Representative and replaced without cost to the Owner, as soon as weather conditions permit and within the specified planting period.

5. Any work required by this specification or the Owner's Representative during the progress of the work, to correct plant defects including the removal of roots or branches, or planting plants that have been bare rooted during installation to observe for or correct root defects shall not be considered as grounds to void any conditions of the warranty. In the event that the Contractor decides that such remediation work may compromise the future health of the plant, the plant or plants in question shall be rejected and replaced with plants that do not contain defects that require remediation or

6. The Contractor is exempt from replacing plants, after Substantial Completion Acceptance and during the warranty period, that are removed by others, lost or damaged due to occupancy of project, lost or damaged by a third party, vandalism, or any natural disaster

7. Replacements shall closely match adjacent specimens of the same species. Replacements shall be subject to all requirements stated in this specification. Make all necessary repairs due to plant replacements. Such repairs shall be done at no extra cost to the Owner.

8. The warranty of all replacement plants shall extend for an additional one-year period from the date of their acceptance after replacement. In the event that a replacement plant is not acceptable during or at the end of the said extended warranty period, the Owner's Representative may elect one more replacement items or credit for each item. These tertiary replacement items are not protected under a warranty period.

9. During and by the end of the warranty period, remove all tree wrap, ties, and guying unless agreed to by the Owner's Representative to remain in place. All trees that do not have sufficient caliper to remain upright, or those requiring additional anchorage in windy locations, shall be staked or remain staked, if required by the Owner's Representative.

B. End of Warranty Final Acceptance - Acceptance of plants at the end of the warranty period.

1. At the end of the warranty period, the Owner's Representative shall observe all warranted work, upon written request of the Contractor. The request shall be received at least ten calendar days before the anticipated date for final observation. 2. End of Warranty Final Acceptance will be given only when all the requirements of the work under this specification and in specification sections Planting Soil and Irrigation have been met.

1.2 SELECTION and observation OF PLANTS

A. The Owner's Representative may review all plants subject to approval of size, health, quality, character, etc. Review or approval of any plant during the process of selection, delivery, installation and establishment period shall not prevent that plant from later rejection in the event that the plant quality changes or previously existing defects become apparent that were not observed.

B. Plant Selection: The Owner's Representative reserves the right to select and observe all plants at the nursery prior to delivery and to reject plants that do not meet specifications as set forth in this specification. If a particular defect or substandard element can be corrected at the nursery, as determined by the Owner's Representative, the agreed upon remedy may be applied by the nursery or the Contractor provided that the correction allows the plant to meet the

requirements set forth in this specification. Any work to correct plant defects shall be at the contractor's expense. 1. The Owner's Representative may make invasive observation of the plant's root system in the area of the root collar and the top of the root ball in general in order to determine that the plant meets the quality requirements for depth of the root collar and presence of roots above the root collar. Such observations will not harm the plant.

2. Corrections are to be undertaken at the nursery prior to shipping. C. The Contractor shall bear all cost related to plant corrections.

pecifications, but which may be available for substitution

D. All plants that are rejected shall be immediately removed from the site and acceptable replacement plants provided at no

E. Submit to the Owner's Representative, for approval, plant sources including the names and locations of nurseries proposed as sources of acceptable plants, and a list of the plants they will provide. The plant list shall include the botanical and common name and the size at the time of selection. Observe all nursery materials to determine that the materials meet the requirements of this section

1.3 PLANT SUBSTITUTIONS FOR PLANTS NOT AVAILABLE

A. Submit all requests for substitutions of plant species, or size to the Owner's Representative, for approval, prior to purchasing the proposed substitution. Request for substitution shall be accompanied with a list of nurseries contacted in the search for the required plant and a record of other attempts to locate the required material. Requests shall also include sources of plants found that may be of a smaller or larger size, or a different shape or habit than specified, or plants of the same genus and species but different cultivar origin, or which may otherwise not meet the requirements of the specifications, but which may be available for substitution.

1.4 SITE CONDITIONS

A. Submit all requests for substitutions of plant species, or size to the Owner's Representative, for approval, prior to purchasing the proposed substitution. Request for substitution shall be accompanied with a list of nurseries contacted in the search for the required plant and a record of other attempts to locate the required material. Requests shall also include sources of plants found that may be of a smaller or larger size, or a different shape or habit than specified, or plants of the same genus and species but different cultivar origin, or which may otherwise not meet the requirements of the

B. It is the responsibility of the Contractor to be familiar with the local growing conditions, and if any specified plants will be in

C. This specification requires that all Planting Soil and Irrigation (if applicable) work be completed and accepted prior to the

installation of any plants. 1. Planting operations shall not begin until such time that the irrigation system is completely operational for the area(s) to be planted, and the irrigation system for that area has been preliminarily observed and approved by the Owner's

C. Actual planting shall be performed during those periods when weather and soil conditions are suitable in accordance with locally accepted horticultural practices.

1. Do not install plants into saturated or frozen soils. Do not install plants during inclement weather, such as rain or snow or

during extremely hot, cold or windy conditions. 1.5 PLANTING AROUND UTILITIES

Contractor shall carefully examine the civil, record, and survey drawings to become familiar with the

A. existing underground conditions before digging. B. Determine location of underground utilities and perform work in a manner that will avoid possible damage. Hand excavate,

as required. Maintain grade stakes set by others until parties concerned mutually agree upon removal.

C. Notification of Local Utility Locator Service, Insert PHONE NUMBER, is required for all planting areas: The Contractor is responsible for knowing the location and avoiding utilities that are not covered by the Local Utility Locator Service.

2.1 PLANTS: GENERAL A. Standards and measurement: Provide plants of quantity, size, genus, species, and variety or cultivars as shown and

1. All plants including the root ball dimensions or container size to trunk caliper ratio shall conform to ANSI Z60.1 "American Standard for Nursery Stock" latest edition, unless modified by provisions in this specification. When there is a conflict

between this specification and ANSI Z60.1, this specification section shall be considered correct. 2. Plants larger than specified may be used if acceptable to the Owner's Representative. Use of such plants shall not increase the contract price. If larger plants are accepted the root ball size shall be in accordance with ANSI Z-60.1. Larger

plants may not be acceptable if the resulting root ball cannot be fit into the required planting space. 3. If a range of size is given, no plant shall be less than the minimum size and not less than 50 percent of the plants shall be as large as the maximum size specified. The measurements specified are the minimum and maximum size acceptable and

are the measurements after pruning, where pruning is required. B. Proper Identification: All trees shall be true to name as ordered or shown on planting plans and shall be labeled individually or in groups by genus, species, variety and cultivar.

Compliance: All trees shall comply with federal and state laws and regulations requiring observation for plant disease, pests, and weeds. Observation certificates required by law shall accompany each shipment of plants. Clearance from the local county agricultural commissioner, if required, shall be obtained before planting trees originating outside the county in which they are to be planted.

C. Plant Quality:

1. General: Provide healthy stock, grown in a nursery and reasonably free of die-back, disease, insects, eggs, bores, and larvae. At the time of planting all plants shall have a root system, stem, and branch form that will not restrict normal growth, stability and health for the expected life of the plant

Plant quality above the soil line:

a. Plants shall be healthy with the color, shape, size and distribution of trunk, stems, branches, buds and leaves normal to the plant type specified. Tree quality above the soil line shall comply with the project Crown Acceptance details (or

Florida Grades and Standards, tree grade Florida Fancy or Florida #1) and the following: 1.) Crown: The form and density of the crown shall be typical for a young specimen of the species or cultivar pruned to

a central and dominant leader a.) Crown specifications do not apply to plants that have been specifically trained in the nursery as topiary, espalier, multi-stem, clump, or unique selections such as contorted or weeping cultivars.

2.) Leaves: The size, color, and appearance of leaves shall be typical for the time of year and stage of growth of the species or cultivar. Trees shall not show signs of prolonged moisture stress or over watering as indicated by wilted,

3.) Branches: Shoot growth (length and diameter) throughout the crown should be appropriate for the age and size of the species or cultivar. Trees shall not have dead, diseased, broken, distorted, or otherwise injured branches.

a.) Main branches shall be distributed along the central leader not clustered together. They shall form a balanced crown appropriate for the cultivar/species

b.) Branch diameter shall be no larger than two-thirds (one-half is preferred) the diameter of the central leader measured 1 inch

c.) The attachment of the largest branches (scaffold branches) shall be free of included bark.

4.) Trunk: The tree trunk shall be relatively straight, vertical, and free of wounds that penetrate to the wood (properly made pruning cuts, closed or not, are acceptable and are not considered wounds), sunburned areas, conks (fungal fruiting bodies), wood cracks, sap leakage, signs of boring insects, galls, cankers, girdling ties, or lesions (mechanical 5.) Temporary branches, unless otherwise specified, can be present along the lower trunk below the lowest main (scaffold) branch, particularly for trees less than 1 inch in caliper. These branches should be no greater than 3/8-inch diameter. Clear trunk

should be no more than 40% of the total height of the tree. b. Trees shall have one central leader. If the leader was headed, a new leader (with a live terminal bud) at least one-half the diameter of the pruning cut shall be present.

1.) All trees are assumed to have one central leader trees unless a different form is specified in the plant list or

c. All graft unions, where applicable, shall be completely closed without visible sign of graft rejection. All grafts shall be

d. Trunk caliper and taper shall be sufficient so that the lower five feet of the trunk remains vertical without a stake. Auxiliary stake may be used to maintain a straight leader in the upper half of the tree.

1. Plant quality at or below the soil line:

a. Plant roots shall be normal to the plant type specified. Root observations shall take place without impacting tree health. Root quality at or below the soil line shall comply with the project Root Acceptance details and the following:

1.) The roots shall be reasonably free of scrapes, broken or split wood.

The root system shall be reasonably free of injury from biotic (e.g., insects and pathogens) and abiotic (e.g., herbicide toxicity and salt injury) agents. Wounds resulting from root pruning used to produce a high quality root system are not considered injuries. 3.) A minimum of three structural roots reasonably distributed around the trunk (not clustered on one side) shall be found in each plant. Root distribution shall be uniform throughout the root ball, and growth shall be appropriate for the species.

a.) Plants with structural roots on only one side of the trunk (J roots) shall be rejected. 4.) The root collar shall be within the upper 2 inches of the substrate/soil. Two structural roots shall reach the side of the root ball near the top surface of the root ball. The grower may request a modification to this requirement for species with roots that rapidly descend, provided that the grower removes all stem girdling roots above the structural roots across the top of the root

5.) The root system shall be reasonably free of stem girdling roots over the root collar or kinked roots from nursery production practices. a.) Plant Grower Certification: The final plant grower shall be responsible to have determined that the plants have been root pruned at each step in the plant production process to remove stem girdling roots and kinked roots, or that the

previous production system used practices that produce a root system throughout the root ball that meets these specifications. Regardless of the work of previous growers, the plant's root system shall be modified at the final production stage, if needed, to produce the required plant root quality. The final grower shall certify in writing that all plants are reasonably free of stem girdling and kinked roots as defined in this specification, and that the tree has been grown and harvested to produce a plant that meets these specifications.

6.) At time of observations and delivery, the root ball shall be moist throughout. Roots shall not show signs of excess soil moisture conditions as indicated by stunted, discolored, distorted, or dead roots

A. Submittals: Submit for approval the required plant quality certifications from the grower where plants are to be purchased, for each plant type. The certification must state that each plant meets all the above plant quality requirement 1. The grower's certification of plant quality does not prohibit the Owner's Representative from observing any plant or rejecting the

plant if it is found to not meet the specification requirements. 2.2 ROOT BALL PACKAGE OPTIONS: The following root ball packages are permitted. Specific root ball packages shall be required where indicated on the plant list or in this specification. Any type of root ball packages that is not specifically defined in this specification shall

A. CONTAINER (INCLUDING ABOVE-GROUND FABRIC CONTAINERS AND BOXES) PLANTS

1. Container plants may be permitted only when indicated on the drawing, in this specification, or approved by the Owner's Representative

2. Provide plants shall be established and well rooted in removable containers 3. Container class size shall conform to ANSI Z60.1 for container plants for each size and type of plant.

B. BARE ROOT PLANTS

1. Harvest bare root plants while the plant is dormant and a minimum of 4 weeks prior to leaf out (bud break). 2. The root spread dimensions of the harvested plants shall conform to ANSI Z60.1 for nursery grown bare root plants for each size and type of plant. Just prior to shipping to the job site, dip the root system into a slurry of hydrogel (cross linked polyacrylamide) and water mixed at a rate of 15 oz. of hydrogel in 25 gallons of water. Do not shake off the excess hydrogel. Place the root system in

a pleated black plastic bag and tie the bag snugly around the trunk. Bundle and tie the upper branches together. 3. Keep the trees in a cool dark space for storage and delivery. If daytime outside temperatures exceeds 70 degrees F, utilize a refrigerated storage area with temperature between 35 and 50 degrees.

4. Where possible, plan time of planting to be before bud break. For trees to be planted after bud break, place the trees before bud break in an irrigated bed of pea gravel

a. The pea gravel bed shall be 18 inches deep over a sheet of plastic. b. Space trees to allow the unbundled branches to grow without shading each other.

c. Once stored in pea gravel, allow the trees sufficient time for the new root system to flush and spring growth of leaves to fully develop before planting. d. Pea gravel stored trees may be kept for up to one growing season.

e. Pea gravel stored trees shall be dipped, packaged and shipped similar to the requirements for freshly dug bare root trees above. C. IN-GROUND FABRIC BAG-GROWN

1. In-ground fabric container plants may be permitted only when indicated on the drawing, in this specification, or approved by the Owner's Representative.

Provide plants established and well rooted. 2.3 Annual flowering and seasonal color plants

A. Container or flat-grown plants should be sized as noted in the planting plan. Plants shall be well-rooted and healthy. 2.4 Planting Soil A. in this specification means the soil at the planting site, or imported as modified and defined in specification Section Planting Soil. If

there is no Planting Soil specification, the term Planting Soil shall mean the soil at the planting site within the planting hole.

2.5 MULCH A. Mulch shall be 3" layer of "Walk on" grade, coarse, ground, from tree and woody brush sources. The size range shall be a minimum (less than 25% or less of volume) fine particles 3/8 inch or less in size, and a maximum size of individual pieces (largest 20% or less of volume) shall be approximately 1 to 1-1/2 inch in diameter and maximum length approximately 4 to 8". Pieces larger than 8 inch long that are visible on the surface of the mulch after installation shall be removed.

1. It is understood that mulch quality will vary significantly from supplier to supplier and region to region. The above requirements may be modified to conform to the source material from locally reliable suppliers as approved by the Owner's Representative.

B. Submit supplier's product specification data sheet and a one gallon sample for approval. 2.6 TREE STAKING AND GUYING MATERIA

A. Tree guying to be flat woven polypropylene material, 3/4 inch wide, and 900 lb. break strength. Color to be Green. Product to be ArborTie manufactured by Deep Root Partners, L.P. or approved equal. B. Stakes shall be lodge pole stakes free of knots and of diameters and lengths appropriate to the size of plant as required to adequately

C. Below ground anchorage systems to be constructed of 2 x 2 dimensional untreated wood securing (using 3 inch long screws) horizontal portions to 4 feet long vertical stakes driven straight into the ground outside the root ball.

D. Submit manufacturer's product data for approval.

A. Tree Bark Protectors shall be black extruded resin mesh, 4 inches in diameter, 5 feet long. As manufactured by Industrial Netting, Minneapolis, MN, USA or approved equal.

B. Fasten the split side of the Tree Bark Protector together in three places with black plastic tape.

C. Submit manufacturers' product data for approval 2.8 CHEMICAL or biological ADDITIVES

PART 3 -EXECUTION

3.1 SITE EXAMINATION

3.2 DELIVERY, STORAGE AND HANDLING

3.5 Adverse weather conditions

A. Examine the surface grades and soil conditions to confirm that the requirements of the Specification Section - Planting Soil - and the soil and drainage modifications indicated on the Planting Soil Plan and Details (if applicable) have been completed. Notify the Owner's Representative in writing of any unsatisfactory conditions.

A. Protect materials from deterioration during delivery and storage. Adequately protect plants from drying out, exposure of roots to sun, wind or extremes of heat and cold temperatures. If planting is delayed more than 24 hours after delivery, set plants in a location protected from sun and wind. Provide adequate water to the root ball package during the shipping and storage period. 1. All plant materials must be available for observation prior to planting.

2. Using a soil moisture meter, periodically check the soil moisture in the root balls of all plants to assure that the plants are being

adequately watered. Volumetric soil moisture shall be maintained above wilting point and below field capacity for the root ball B. Do not deliver more plants to the site than there is space with adequate storage conditions. Provide a suitable remote staging area for

plants and other supplies. 1. The Owner's Representative or Contractor shall approve the duration, method and location of storage of plants.

C. Provide protective covering over all plants during transporting. 3.4 PLANTING SEASON

3.8 SOIL PROTECTION DURING plant DELIVERY and installation

A. Planting shall only be performed when weather and soil conditions are suitable for planting the materials specified in accordance with locally accepted practice. Install plants during the planting time as described below unless otherwise approved in writing by the Owner's Representative. In the event that the Contractor request planting outside the dates of the planting season, approval of the request does not change the requirements of the warranty.

A. No planting shall take place during extremely hot, dry, windy or freezing weather.

3.6 COORDINATION WITH PROJECT WORK A. The Contractor shall coordinate with all other work that may impact the completion of the work.

B. Prior to the start of work, prepare a detailed schedule of the work for coordination with other trades C. Coordinate the relocation of any irrigation lines, heads or the conduits of other utility lines that are in conflict with tree locations. Root balls shall not be altered to fit around lines. Notify the Owner's Representative of any conflicts encountered. 3.7 LAYOUT AND PLANTING SEQUENCE

A. Relative positions of all plants and trees are subject to approval of the Owner's Representative. B. Notify the Owner's Representative, one (1) week prior to layout. Layout all individual tree and shrub locations. Place plants above surface at planting location or place a labeled stake at planting location. Layout bed lines with paint for the Owner's Representative's approval. Secure the Owner's Representative's acceptance before digging and start of planting work.

C. When applicable, plant trees before other plants are installed. D. It is understood that plants are not precise objects and that minor adjustments in the layout will be required as the planting plan is constructed. These adjustments may not be apparent until some or all of the plants are installed. Make adjustments as required by the Owner's Representative including relocating previously installed plants.

A. Protect soil from compaction during the delivery of plants to the planting locations, digging of planting holes and installing plants 1. Where possible deliver and plant trees that require the use of heavy mechanized equipment prior to final soil preparation and tilling. Where possible, restrict the driving lanes to one area instead of driving over and compacting a large area of soil. 2. Till to a depth of 6 inches, all soil that has been driven over during the installation of plants.

3.9 SOIL MOISTURE A. Volumetric soil moisture level, in both the planting soil and the root balls of all plants, prior to, during and after planting shall be above permanent wilting point and below field capacity for each type of soil texture within the following ranges.

Soil type Permanent wilting point Field capacity Sand, Loamy sand, Sandy loam5-8%12-18%

Loam, Sandy clay, Sandy clay loam14-25%27-36%

Clay loam, Silt loam11-22%31-36%

Silty clay, Silty clay loam22-27%38-41%

1. Volumetric soil moisture shall be measured with a digital moisture meter. The meter shall be the Digital Soil Moisture Meter, DSMM500 by General Specialty Tools and Instruments, or approved equivalent The Contractor shall confirm the soil moisture levels with a moisture meter. If the moisture is too high, suspend planting

operations until the soil moisture drains to below field capacity 3.10 INSTALLATION OF plants: General cont.

E. Container and Boxed Root Ball Shaving: The outer surfaces of ALL plants in containers and boxes, including the top, sides and bottom of the root ball shall be shaved to remove all circling, descending, and matted roots. Shaving shall be performed using saws, knives, sharp shovels or other suitable equipment that is capable of making clean cuts on the roots. Shaving shall remove a minimum of one inch of root mat or up to 2 inches as required to remove all root segments that are not growing reasonably radial to the trunk.

F. Exposed Stem Tissue after Modification: The required root ball modifications may result in stem tissue that has not formed trunk bark being exposed above the soil line. If such condition occurs, wrap the exposed portion of the stem in a protective wrapping with a white filter fabric. Secure the fabric with biodegradable masking tape. DO NOT USE string, twine, green nursery ties or any other material that may girdle the trunk if not removed.

G. Excavation of the Planting Space: Using hand tools or tracked mini-excavator, excavate the planting hole into the Planting Soil to the depth of the root ball measured after any root ball modification to correct root problems, and wide enough for working room around the root ball or to the size indicated on the drawing or as noted below.

1. For trees and shrubs planted in soil areas that are NOT tilled or otherwise modified to a depth of at least 12 inches over a distance of more than 10 feet radius from each tree, or 5 feet radius from each shrub, the soil around the root ball shall be loosened as defined below or as indicated on the drawings.

a. The area of loosening shall be a minimum of 3 times the diameter of the root ball at the surface sloping to 2 times the diameter of the root ball at the depth of the root ball.

b. Loosening is defined as digging into the soil and turning the soil to reduce the compaction. The soil does not have to be removed from the hole, just dug, lifted and turned. Lifting and turning may be accomplished with a tracked mini excavator, or hand shovels.

shrubs planted in soil areas that are NOT tilled or otherwise modified 3. The measuring point for root ball depth shall be the average height of the outer edge of the root ball after any required root ball modification

2. If an auger is used to dig the initial planting hole, the soil around the auger hole shall be loosened as defined above for trees and

the planting holes, all soil that has been driven over shall be tilled to a depth of 6 inches B. For trees to be planted in prepared Planting Soil that is deeper than the root ball depth, compact the soil under the root ball using a mechanical tamper to assure a firm bedding for the root ball. If there is more than 12 inches of planting soil under the root ball excavate and tamp the planting soil in lifts not to exceed 12 inches.

4. If motorized equipment is used to deliver plants to the planting area over exposed planting beds, or used to loosen the soil or dig

C. Set top outer edge of the root ball at the average elevation of the proposed finish. Set the plant plumb and upright in the center of the planting hole. The tree graft, if applicable, shall be visible above the grade. Do not place soil on top of the root ball.

E. Backfill the space around the root ball with the same planting soil or existing soil that was excavated for the planting space. See Specification Section Planting Soil, for requirements to modify the soil within the planting bed. F. Brace root ball by tamping Planting Soil around the lower portion of the root ball. Place additional Planting Soil around base and

D. The Owner's Representative may request that plants orientation be rotated when planted based on the form of the plant.

sides of ball in six-inch (6") lifts. Lightly tamp each lift using foot pressure or hand tools to settle backfill, support the tree and eliminate voids. DO NOT over compact the backfill or use mechanical or pneumatic tamping equipment. Over compaction shall be defined as greater than 85% of maximum dry density, standard proctor or greater than 250 psi as measured by a cone penetrometer when the volumetric soil moisture is lower than field capacity. 1. When the planting hole has been backfilled to three quarters of its depth, water shall be poured around the root ball and

planting soil is brought to grade level. J. Where indicated on the drawings, build a 4 inch high, level berm of Planting Soil around the outside of the root ball to retain water.

drain to below field capacity before finishing the planting. Air pockets shall be eliminated and backfill continued until the

allowed to soak into the soil to settle the soil. Do not flood the planting space. If the soil is above field capacity, allow the soil to

Tamp the berm to reduce leaking and erosion of the saucer. K. Thoroughly water the Planting Soil and root ball immediately after planting.

L. Remove all nursery plant identification tags and ribbons as per Owner's Representative instructions. The Owner's Representative's seals are to remain on plants until the end of the warranty period.

M.Remove corrugated cardboard trunk protection after planting. N. Follow additional requirements for the permitted root ball packages.

2. Remove the container.

A. IN-GROUND FABRIC CONTAINERS

F. Press soil to bring the root system in contact with the soil

B. The trees shall be placed with their vertical axis in a plumb position.

O. CONTAINER (INCLUDES BOXED AND ABOVE-GROUND FABRIC CONTAINERS) PLANTS 1. This specification assumes that most container plants have significant stem girdling and circling roots, and that the root collar is too low in the root ball.

3. Perform root ball shaving as defined in Installation of Plants: General above. 4. Remove all roots and substrate above the root collar and the main structural roots according to root correction details so root

system conforms to root observations detail. 5. Remove all substrate at the bottom of the root ball that does not contain roots 6. Using a hose, power washer or air excavation device, wash out the substrate from around the trunk and top of the remaining root ball and find and remove all stem girdling roots within the root ball above the top of the structural roots.

1. Dig the planting hole to the diameter of the spread of the roots to a depth in the center that maintains the root collar at the elevation of the surrounding finished grade and slightly deeper along the edges of the hole.

2. Spread all roots out radial to the trunk in the prepared hole making the hole wider where needed to accommodate long roots.

Root tips shall be directed away from the trunk. Prune any broken roots removing the least amount of tissue possible. 3. Maintain the trunk plumb while backfilling soil around the roots. 4. Lightly tamp the soil around the roots to eliminate voids and reduce settlement.

1. Remove the fabric container from the root ball. Cut roots at the edge of the container as needed to extract the fabric from the roots. Make clean cuts with sharp tools; do not tear roots away from the fabric 2. Observe the root system after the container is removed to confirm that the root system meets the quality standards.

3.11 GROUNDCOVER, PERENNIAL AND ANNUAL PLANTING A. Assure that soil moisture is within the required levels prior to planting. Irrigation, if required, shall be applied at least 12 hours prior to planting to avoid planting in muddy soils.

B. Assure that soil grades in the beds are smooth and as shown on the plans. C. Plants shall be planted in even, triangularly spaced rows, at the intervals called out for on the drawings, unless otherwise noted. The first row of Annual flower plants shall be 6 inches from the bed edge unless otherwise directed.

D. Dig planting holes sufficiently large enough to insert the root system without deforming the roots. Set the top of the root system at the grade of the soil. E. Schedule the planting to occur prior to application of the mulch. If the bed is already mulched, pull the mulch from around the hole and plant into the soil. Do not plant the root system in the mulch. Pull mulch back so it is not on the root ball surface.

G. Spread any excess soil around in the spaces between plants. H. Apply mulch to the bed being sure not to cover the tops of the plants with or the tops of the root ball with mulch. I. Water each planting area as soon as the planting is completed. Apply additional water to keep the soil moisture at the required

levels. Do not over water. 3.12 Palm Planting A. Palm trees shall be placed at grade making sure not to plant the tree any deeper in the ground than the palm trees originally stood.

C. All backfill shall be native soil except in cases where planting in rock. Water-settle the back fill. D. Do not cover root ball with mulch or topsoil.

E. Provide a watering berm at each palm. Berms shall extend a minimum of 18 inches out from the trunk all around and shall be a F. Remove twine which ties fronds together after placing palm in planting hole and securing it in the upright position. 3.13 STAKING AND GUYING

A. Do not stake or guy trees unless specifically required by the Contract Documents, or in the event that the Contractor feels that staking is the only alternative way to keep particular trees plumb. 1. The Owner's Representative shall have the authority to require that trees are staked or to reject staking as an alternative way to

Representative may choose to reject these trees rather than utilize staking to temporarily support the tree. B. Trees that are guyed shall have their guys and stakes removed after one full growing season or at other times as required by the C. Tree guying shall utilize the tree staking and guying materials specified. Guying to be tied in such a manner as to create a minimum

2. Trees that required heavily modified root balls to meet the root quality standards may become unstable. The Owner's

12-inch loop to prevent girdling. Refer to manufacturer's recommendations and the planting detail for installation.

1. Plants shall stand plumb after staking or guying. 2. Stakes shall be driven to sufficient depth to hold the tree rigid.

Do not straighten plants by pulling the trunk with guys.

D. For trees planted in planting mix over waterproofed membrane, use dead men buried 24 inches to the top of the dead man, in the soil. Tie the guy to the dead man with a double wrap of line around the dead man followed by a double half hitch. When guys are removed, leave the dead men in place and cut the guy tape 12 inches above the ground, leaving the tape end covered in mulch.

A. For all street trees in commercial areas where indicted on the drawings, apply a Tree Bark Protector to each tree. 3.15 STRAIGHTENING PLANTS A. Maintain all plants in a plumb position throughout the warranty period. Straighten all trees that move out of plumb including those

not staked. Plants to be straightened shall be excavated and the root ball moved to a plumb position, and then re-backfilled.

3.16 INSTALLATION OF FERTILIZER AND OTHER CHEMICAL ADDITIVES

A. Do not apply any soluble fertilizer to plantings during the first year after transplanting unless soil test determines that fertilizer or other chemical additives is required. Apply chemical additives only upon the approval of the Owner's Representative

B. Controlled release fertilizers shall be applied according to the manufacturer's instructions and standard horticultural practices.

3.17 PRUNING OF TREES AND SHRUBS A. Prune plants as directed by the Owner's Representative. Pruning trees shall be limited to addressing structural

defects as shown in details; follow recommendations in "Structural Pruning: A Guide For The Green Industry" published by Urban Tree Foundation, Visalia CA. B. All pruning shall be performed by a person experienced in structural tree pruning.

C. Except for plants specified as multi-stemmed or as otherwise instructed by the Owner's Representative, preserve D. Pruning of large trees shall be done using pole pruners or if needed, from a ladder or hydraulic lift to gain access to

the top of the tree. Do not climb in newly planted trees. Small trees can be structurally pruned by laying them over before planting. Pruning may also be performed at the nursery prior to shipping. E. Remove and replace excessively pruned or malformed stock resulting from improper pruning that occurred in the

nursery or after.

F. Pruning shall be done with clean, sharp tools. G. No tree paint or sealants shall be used.

3.18 MULCHING OF PLANTS - See L1 for mulch type

site by the Contractor.

A. Apply 3 inches of mulch before settlement, covering the entire planting bed area. Install no more than 1 inch of mulch over the top of the root balls of all plants. Taper to 2 inches when abutting pavement. B. For trees planted in lawn areas the mulch shall extend to a 5 foot radius around the tree or to the extent indicated on the plans.

C. Lift all leaves, low hanging stems and other green portions of small plants out of the mulch if covered.

3.19 Planting bed finishing A. After planting, smooth out all grades between plants before mulching.

B. Separate the edges of planting beds and lawn areas with a smooth, formed edge cut into the turf with the bed mulch level slightly lower, 1 and 2 inches, than the adjacent turf sod or as directed by the Owner's Representative. Bed edge lines shall be a depicted on the drawings.

A. The Contractor shall be fully responsible to ensure that adequate water is provided to all plants from the point of installation until the date of Substantial Completion Acceptance. The Contractor shall adjust the automatic irrigation system, if available, and apply additional or adjust for less water using hoses as required. B. Hand water root balls of all plants to assure that the root balls have moisture above wilt point and below field capacity. Test the moisture content in each root ball and the soil outside the root ball to determine the water

3.21 CLEAN-UP A. During installation, keep the site free of trash, pavements reasonably clean and work area in an orderly condition at the end of each day. Remove trash and debris in containers from the site no less than once a week 1. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Contractor from all

surfaces within the project or on public right of ways and neighboring property.

planting beds and that all tags and flagging tape are removed from the site. The Owner's Representative's seals are to remain on the trees and removed at the end of the warranty period. C. Make all repairs to grades, ruts, and damage by the plant installer to the work or other work at the site. D. Remove and dispose of all excess planting soil, subsoil, mulch, plants, packaging, and other material brought to the

B. Once installation is complete, wash all soil from pavements and other structures. Ensure that mulch is confined to

3.22 PROTECTION DURING CONSTRUCTION A. The Contractor shall protect planting and related work and other site work from damage due to planting operations, operations by other Contractors or trespassers. Maintain protection during installation until Substantial

Completion Acceptance. Treat, repair or replace damaged work immediately. B. Damage done by the Contractor, or any of their sub-contractors to existing or installed plants, or any other parts of the work or existing features to remain, including roots, trunk or branches of large existing trees, soil, paving, utilities. lighting, irrigation, other finished work and surfaces including those on adjacent property, shall be cleaned, repaired or replaced by the Contractor at no expense to the Owner. The Owner's Representative shall determine when such cleaning, replacement or repair is satisfactory.

A. During the project work period and prior to Substantial Completion Acceptance, the Contractor shall maintain all

B. Maintenance during the period prior to Substantial Completion Acceptance shall consist of pruning, watering, cultivating, weeding, mulching, removal of dead material, repairing and replacing of tree stakes, tightening and repairing of guys, repairing and replacing of damaged tree wrap material, resetting plants to proper grades and upright position, and furnishing and applying such sprays as are necessary to keep plantings reasonably free of damaging insects and disease, and in healthy condition. The threshold for applying insecticides and herbicide shall follow established Integrated Pest Management (IPM) procedures. Mulch areas shall be kept reasonably free of weeds, grass.

3.24 Substantial Completion Acceptance A. Upon written notice from the Contractor, the Owners Representative shall review the work and make a determination if the work is substantially complete.

1. Notification shall be at least 7 days prior to the date the contractor is requesting the review. B. The date of substantial completion of the planting shall be the date when the Owner's Representative accepts that all work in Planting, Planting Soil, and Irrigation installation sections is complete.

Representative. The date of substantial completion may be different than the date of substantial completion for the other sections of the project.

Representative may take corrective action.

the warranty.

3.23 PLANT MAINTENANCE PRIOR TO SUBSTANTIAL COMPLETION ACCEPTANCE

3.25 MAINTENANCE DURING THE WARRANTY PERIOD by others A. After Substantial Completion Acceptance, the Contractor shall make sufficient site visits to observe the Owner's maintenance and become aware of problems with the maintenance in time to request changes, until the date of End of Warranty Final Acceptance.

plants in a healthy condition. Such notification must be made in a timely period so that the Owner's

a. Notification must define the maintenance needs and describe any corrective action required.

1. Notify the Owner's Representative in writing if maintenance, including watering, is not sufficient to maintain

2. In the event that the Contractor fails to visit the site and or notify, in writing, the Owner's Representative of

maintenance needs, lack of maintenance shall not be used as grounds for voiding or modifying the provisions of

C. The Plant Warranty period begins at date of written notification of substantial completion from the Owner's

Firm Name and Address

Revision/Issue

Date

Project Name and Address COLUMBUS ST.

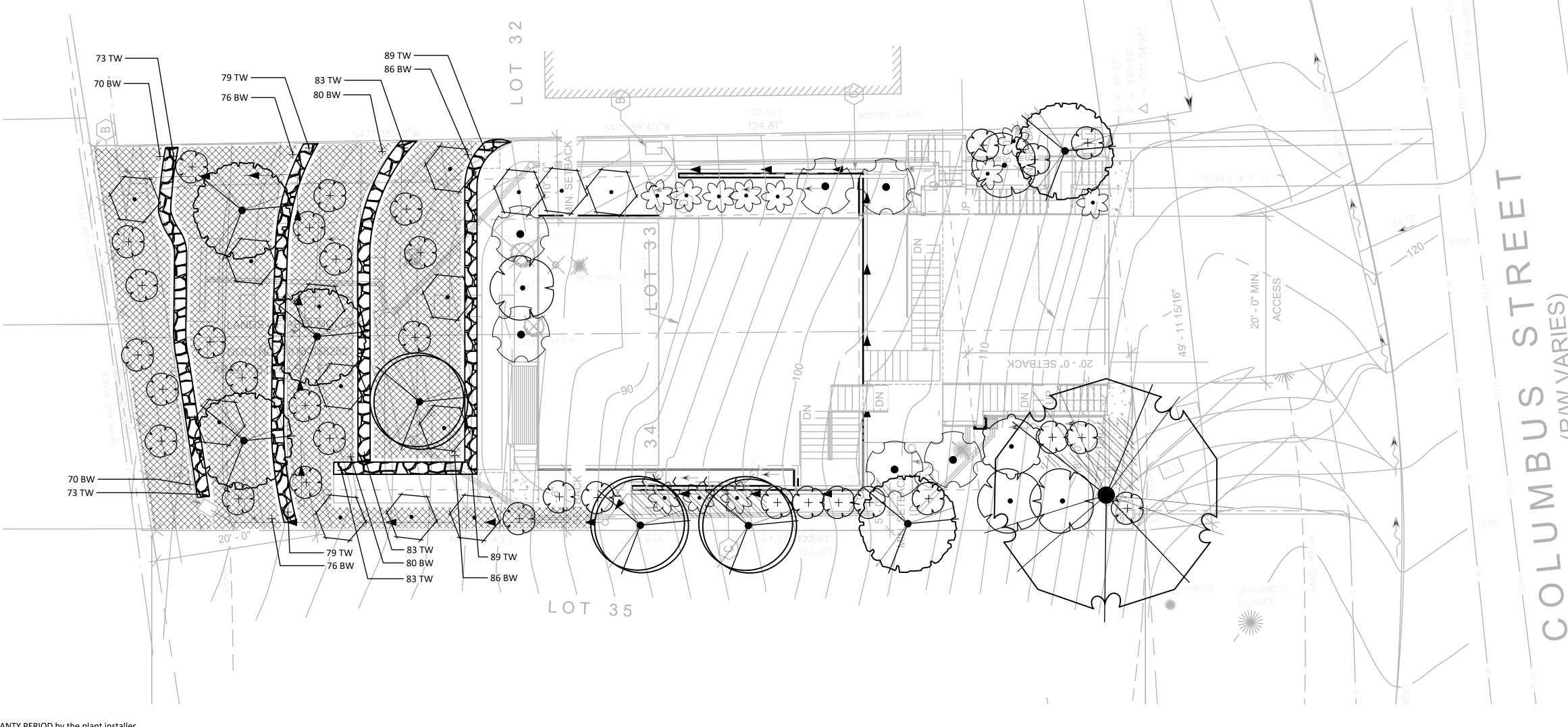
LIC # 1012730 IA CERT # 57436

Drawn By 236-2019 4BInc. Checked By Approved By

General Notes

|EL GRANADA, CA

Call before you dig.



MAINTENANCE DURING THE WARRANTY PERIOD by the plant installer During the warranty period, provide all maintenance for all plantings to keep the plants in a healthy state and the planting areas clean and neat. General requirements:

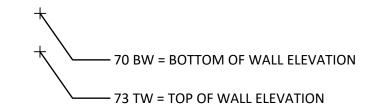
- 1. All work shall be undertaken by trained planting crews under the supervision of a foreman with a minimum of 5 years experience supervising commercial plant maintenance crews. 2. All chemical and fertilizer applications shall be made by licensed applicators for the type of
- chemicals to be used. All work and chemical use shall comply with all applicable local, provincial and federal requirements. 3. Assure that hoses and watering equipment and other maintenance equipment does not
- block paths or be placed in a manner that may create tripping hazards. Use standard safety warning barriers and other procedures to maintain the site in a safe manner for visitors at all times.
- 4. All workers shall wear required safety equipment and apparel appropriate for the tasks being undertaken.
- 5. The Contractor shall not store maintenance equipment at the site at times when they are not in use unless authorized in writing by the Owner's Representative.
- 6. Maintenance vehicles shall not park on the site including walks and lawn areas at any time
- without the Owner's Representative's written permission. 7. Maintain a detailed log of all maintenance activities including types of tasks, date of task, types and quantities of materials and products used, watering times and amounts, and number of each crew. Periodically review the logs with the Owner's Representative, and submit a copy of the logs at the end of each year of the maintenance agreement.
- 8. Meet with the Owner's Representative a minimum of three times a year to review the progress and discuss any changes that are needed in the maintenance program. At the end of the warranty period attend a hand over meeting to formally transfer the responsibilities of maintenance to the Owner's Representative. Provide all information on past maintenance activities and provide a list of critical tasks that will be needed over the next 12 months. Provide all maintenance logs and soil test data. Make the Contractor's supervisor available for a minimum of one year after the end of the warranty period to answer questions about past maintenance.
- 9. Provide the following maintenance tasks: 10. Watering; Provide all water required to keep soil within and around the root balls at
- optimum moisture content for plant growth. 11. Maintain all watering systems and equipment and keep them operational.
- 12. Monitor soil moisture to provide sufficient water. Check soil moisture and root ball moisture with a soil moisture meter on a regular basis and record moisture readings. Do not
- 13. Soil nutrient levels: Take a minimum of 4 soil samples from around the site in the spring and fall and have them tested by an accredited agricultural soil testing lab for chemical composition of plant required nutrients, pH, salt and % organic matter. Test results shall
- recommended by the soil test. 14. Make any other soil test and/or plant tissue test that may be indicated by plant conditions that may not be related to soil nutrient levels such as soil contaminated by other chemicals or lack of chemical uptake by the plant.

include laboratory recommendations for nutrient applications. Apply fertilizers at rates

- 15. Plant pruning: Remove cross over branching, shorten or remove developing co dominant leaders, dead wood and winter-damaged branches. Unless directed by the Owner's Representative, do not shear plants or make heading cuts.
- 16. Restore plants: Reset any plants that have settled or are leaning as soon as the condition is
- 17. Guying and staking: Maintain plant guys in a taught position. Remove tree guys and staking
- after the first full growing season unless directed by Owner's Representative. 18. Weed control: Keep all beds free of weeds. Hand-remove all weeds and any plants that do
- not appear on the planting plan. Chemical weed control is permitted only with the approval of the Owner's Representative. Schedule weeding as needed but not less 12 times per year. 19. Trash removal: Remove all trash and debris from all planting beds and maintain the beds in
- a neat and tidy appearance. The number of trash and debris removal visits shall be no less than 12 times per year and may coincide with other maintenance visits. 20. Plant pest control: Maintain disease, insects and other pests at manageable levels.
- Manageable levels shall be defined as damage to plants that may be noticeable to a professional but not to the average person. Use least invasive methods to control plant disease and insect outbreaks.
- 21. The Owner's Representative must approve in advance the use of all chemical pesticide applications.
- 22. Plant replacement: Replace all plants that are defective as defined in the warranty provisions, as soon as the plant decline is obvious and in suitable weather and season for planting as outlined in above sections. Plants that become defective during the maintenance period shall be covered and replaced under the warranty provisions.
- 23. Mulch: Refresh mulch once a year to maintain complete coverage but do not over mulch. At no time shall the overall mulch thickness be greater that 3 inches. Do not apply mulch within 6 inches of the trunks or stems of any plants. Replacement mulch shall meet the requirements of the original approved material. Mulch shall be no more than one inch on
- 24. Bed edging: Check and maintain edges between mulch and lawn areas in smooth neat lines as originally shown on the drawings.
- 25. Leaf, fruit and other plant debris removal: Remove fall leaf, spent flowers, fruit and plant part accumulations from beds and paved surfaces. Maintain all surface water drains free of debris. Debris removal shall be undertaken at each visit to weed or pick up trash in beds.
- 26. Damage from site use: Repair of damage by site visitors and events, beyond normal wear, are not part of this maintenance. The Owner's Representative may request that the Contractor repair damage beds or plantings for an additional cost. All additional work shall be approved in advance by the Owner's Representative.

### PLANT SCHEDULE

	TREES	CODE	QTY	BOTANICAL / COMMON NAME	CONT		REMARKS
		ARB COM	3	ARBUTUS UNEDO `COMPACTA` / DWARF STRAWBERRY TREE	15 GAL.		WATER USE LOW
		ARC HUR	5	ARCTOSTAPHYLOS MANZANITA `DR. HURD` / DR. HURD MANZANITA	15 GAL.		LOW
<b>~4C</b>		EUC SIL	1	EUCALYPTUS CINEREA / SILVER DOLLAR TREE	15 GAL.		LOW
	SHRUBS	CODE	<u>QTY</u>	BOTANICAL / COMMON NAME	CONT		REMARKS
		BAC TWI	6	BACCHARIS PILULARIS 'TWIN PEAKS II' / TWIN PEAKS COYOTE BRUSH	1 GAL		WATER USE LOW
	+	CEA VAL	32	CEANOTHUS MARITIMUS 'VALLEY VIOLET' / MARITIME CEANOTHUS	5 GAL		LOW
	$\bigcirc$	CEA JUL	1	CEANOTHUS X `JULIA PHELPS` / CALIFORNIA LILAC	5 GAL		LOW
		HET ARB	4	HETEROMELES ARBUTIFOLIA / TOYON	5 GAL		LOW
	$\bigcirc$	MYR CAL	14	MYRICA CALIFORNICA / PACIFIC WAX MYRTLE	5 GAL		MEDIUM
		WOO FIM	11	WOODWARDIA FIMBRIATA / GIANT CHAIN FERN	1 GAL		MEDIUM
	GROUND COVERS	CODE	QTY	BOTANICAL / COMMON NAME	CONT	SPACING	REMARKS
		MYO PAR	182	MYOPORUM PARVIFOLIUM / TRAILING MYOPORUM	1 GAL	36" o.c.	WATER USE LOW
		SAL BEE	8	SALVIA X `BEE`S BLISS` / SAGE	1 GAL	48" o.c.	LOW





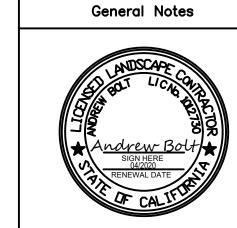
DRY STACK WALL. TYPE. WINDSOR WALL ROCK AVAILABLE FROM: LYNGSO GARDEN MATERIALS 650-364-1730

"I HAVE COMPLIED WITH THE LANDSCAPE DESIGN CRITERIA OF THE MODEL WATER EFFICIENT LANDSCAPE ORDINANCE AND APPLIED THEM ACCORDINGLY FOR THE EFFICIENT USE OF WATER IN THIS DESIGN."

DATED: 07/23/2021

BY: Andrew Bolt





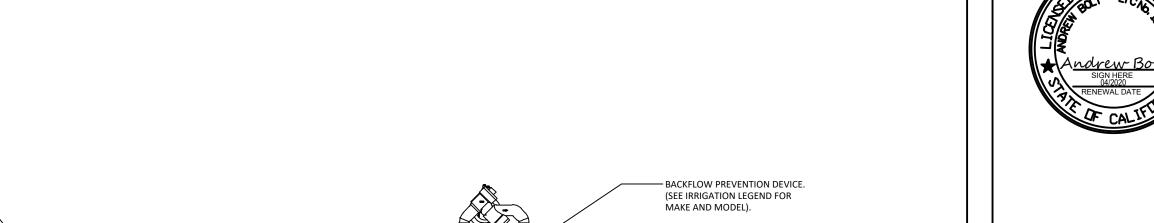
Revision/Issue Date

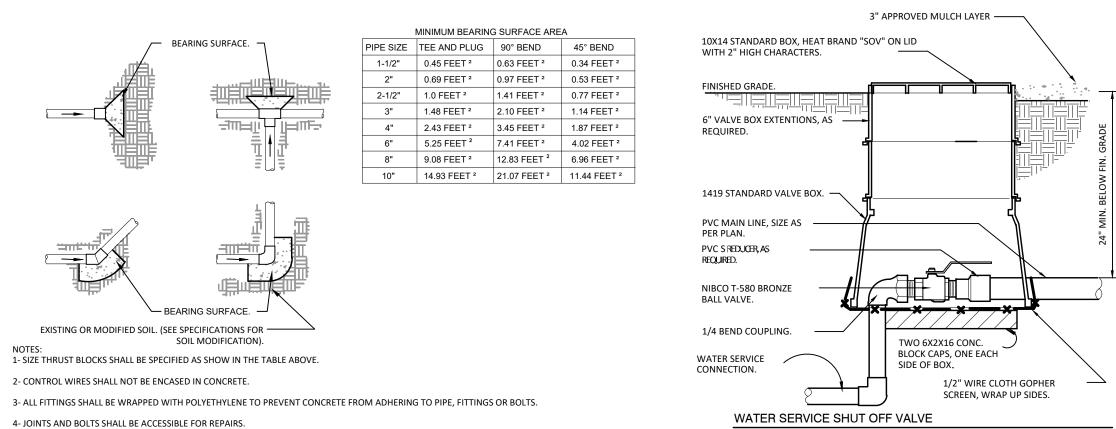


Project Name and Address COLUMBUS ST. EL GRANADA, CA

Project	Drawn By
236-2019	4BInc.
Date	Checked By
9/10/19	4BInc.
Scale	Approved By
1/8"=1'-0"	
	Sheet
. \ / \ /	
NORTH	l







WATER METER. REFER TO CIVIL AND/OR IRRIGATION PLANS FOR SIZE & LOCATION

(4) MASTER VALVE & HUNTER HC FLOW METER

NOTE:A: REFER TO IRRIGATION LAYOUT AND EQUIPMENT SCHEDULE FOR ALL EQUIPMENT LOCATION, TYPE AND SIZES.

(6) GATE VALVE, MAIN LINE TO IRRIGATION VALVES

(5) FERTILIZER INJECTOR (REFER TO IRRIGATION PLAN AND LEGEND.)

3/4" GALVANISED CLOSE — NIPPLE

ELBOW \_

HOSE BIB INSTALLATION\_POST

NTS

\_3/4" GALVANISED

\_\_ 4X4" PRESSURE TREATED POST. SET IN CONCRETE FOOTING

SCH40 SST TEE

---SCH 40 PVC MAILINE

RISER

3/4" GALVANISED —

POC & IRRIGATION EQUIPMENT LAYOUT

NTS

2 GATE VALE

(3) BACKFLOW PREVENTER

5- THRUST BLOCKS SHALL BE A MINIMUM OF 6" THICK. 6- ONE 80 LBS. SACK OF CONCRETE SHALL COVER .6 FT.3

THRUST BLOCK (2)

FINISH GRADE.

ISOLATION VALVE AS SPECIFIED.

BRASS ISOLATION VALVE

1 1/2" = 1'-0"

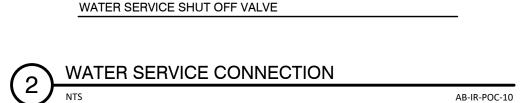
10" DIAMETER ROUND VALVE \_\_\_\_ SET BOX 3" ABOVE GRADE AT SHRUBS. \_\_\_\_\_ SET BOX FLUSH TO GRADE AT LAWN. \_\_\_\_\_

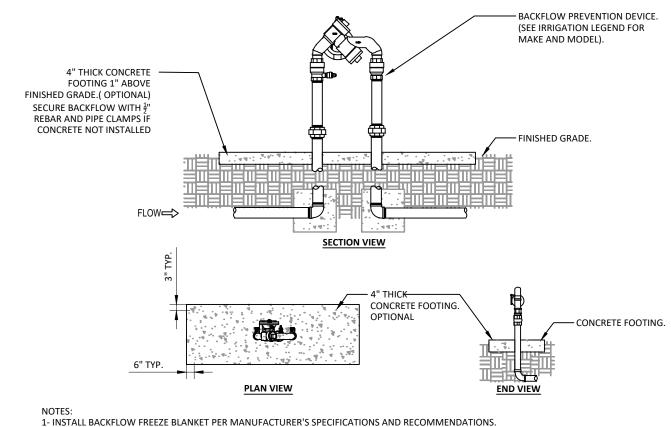
PVC MAIN LINE.

AB-IR-VAL-ISOL-02

\_\_\_\_ SLIP/THREAD COUPLING.

\_\_ 6" SCHEDULE 80 THREADED NIPPLE.



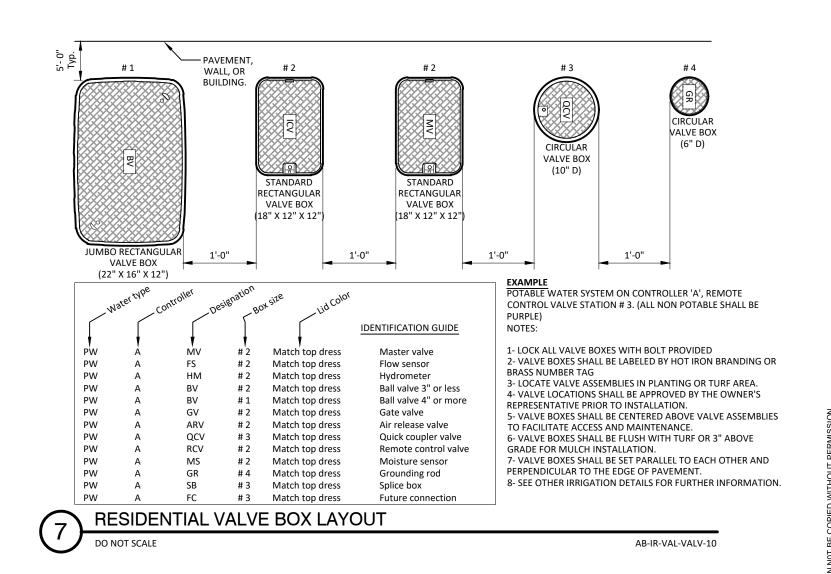


$\bigcirc$	BACKFLOW FEBCO 825YA PREVENTER
$\bigcup_{i} f_i$	NTS

PLASTIC TAG WITH VALVE STATION NUMBER ID: CONTROLLER WIRES WITH 12" MIN. EXPANSION CURLS WITH 3M DBYR CONNECTORS

2- COMMON WIRE AND CONTROLLER WIRE SHALL BE DIRECT BURIAL 14 AWG OR LARGER. COLOR: COMMON (WHITE), CONTROLLER WIRE FOR TURF (BLUE), AND CONTROLLER WIRE FOR SHRUBS (RED). (SEE SPECIFICATIONS FOR 2-WIRE CONTROLLERS). 3- ALL WIRE RUNS SHALL BE CONTINUOUS WITHOUT ANY SPLICES UNLESS APPROVED BY THE OWNER'S REPRESENTATIVE. SEE SPLICE BOX DETAIL. WIRE CONNECTIONS SHALL BE MADE USING DBR/Y-6 CONNECTORS OR APPROVED EQUAL. 4-VALVE BOX SHALL BE WRAPPED WITH MIN. 3 MIL THICK PLASTIC AND SECURE IT USING DUCT TAPE OR ELECTRICAL TAPE. 5- MAINLINES 4" OR LARGER SHALL USE SADDLES AT THE CONNECTIONS POINTS TO THE IRRIGATION VALVE. (SEE SPECIFICATIONS FOR IRRIGATIONS SADDLES) 6- ALL SCH. 80 PVC TO SCH. 40 PVC THREADED CONNECTIONS SHALL BE MADE USING TEFLON TAPE. 7- VALVE BOXES SHALL BE LOCATED IN PLANTING AREAS.

### 8- FLOW METER CONNECTS TO HUNTER HC CONTROLLER SERIES ONLY. MASTER CONTROL VALVE & HUNTER HC FLOW METER 1" = 1'-0"







General Notes

IRRIG,

No.	Revision/Issue	Date
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Project Name and Address COLUMBUS ST. EL GRANADA, CA

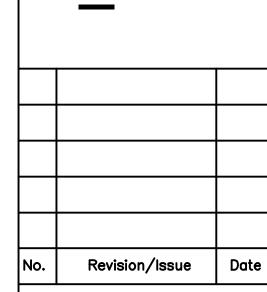
Project	Drawn By
236-2019	4BInc.
Date	Checked By
9/10/19	4BInc.
Scale	Approved By
	Sheet
	IR-2.0



AB-IR-BAC-02

AB-IR-MAI-07

AB-IR-VAL-328406-08





Project Name and Address COLUMBUS ST.

EL GRANADA, CA

Drawn By 4BInc. 236-2019 Checked By 4BInc. 9/10/19 Approved By

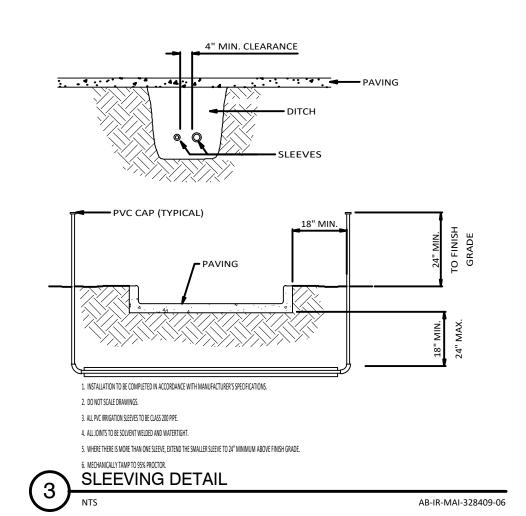
IR-2.1

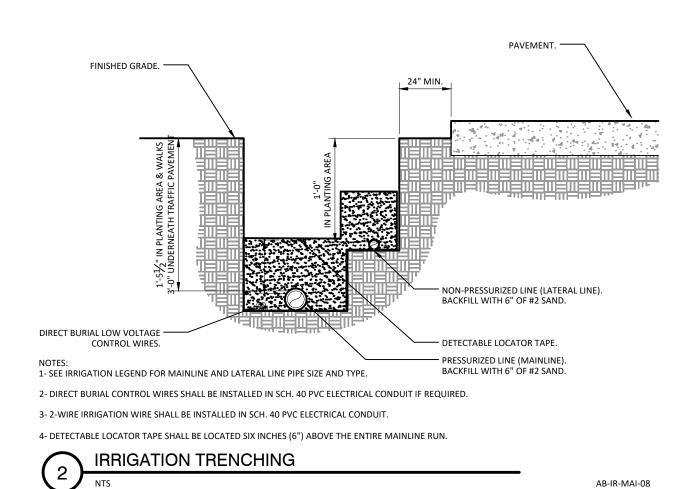
General Notes

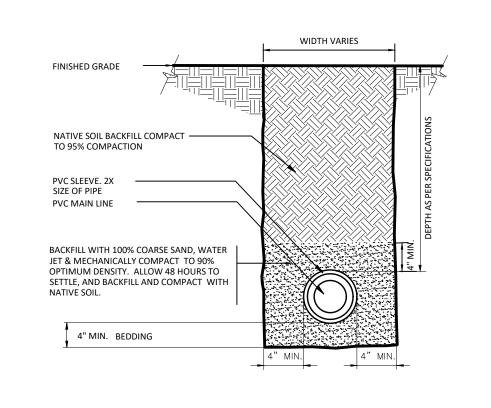
RWPRO-18C INSTALL DETAIL RWPRO-18C PLACEMENT NOTES; WHEN INSTALLING FOLLOW ALL ATTACHED INSTALLATION SPECIFICATIONS. FOR SUPPLY OF ROOTWELL CONTACT IMPERIAL SPRINKLER SERVICES 925-667-1290 OR 408-217-7686 ROOTWELL PLACEMENT - 15 GALLON TREE

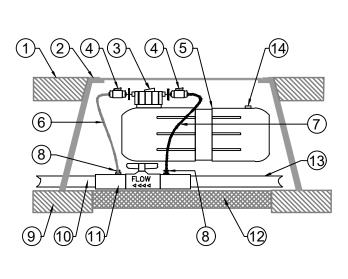
NTS

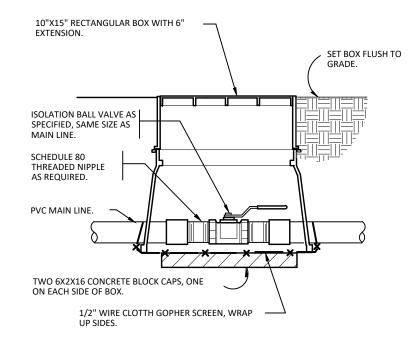
1 FINISHED GRADE.

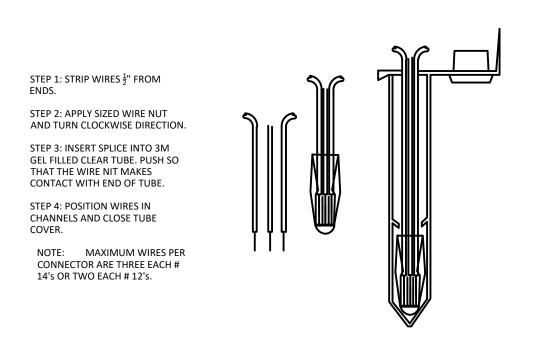


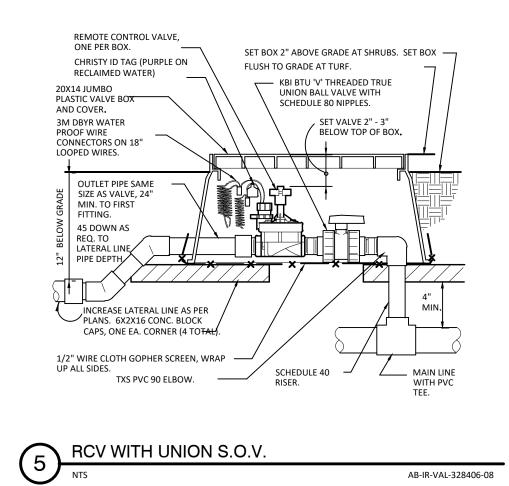




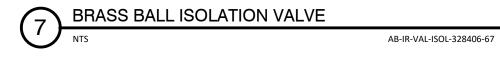




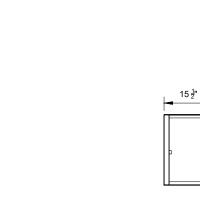


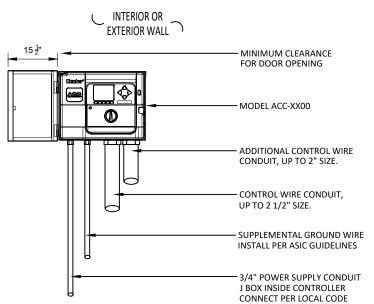


11 IS PURCHASED SEPARATELY.









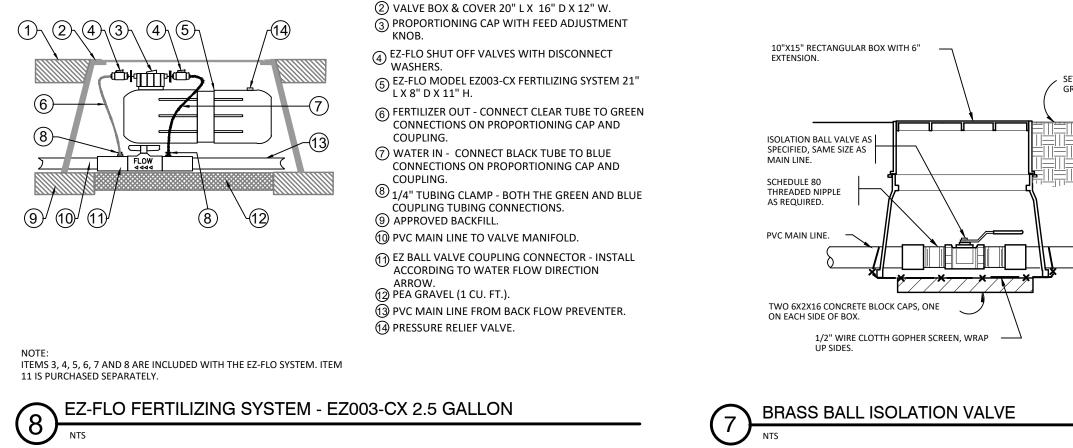
SOLAR SYNC SYSTEM WITH HUNTER HC CONTROLLER

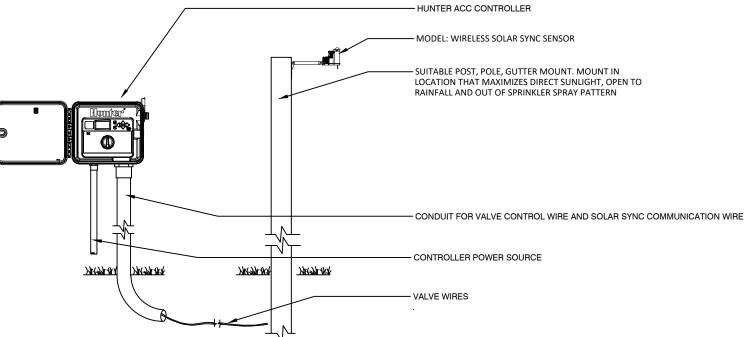
1" = 1'-0"

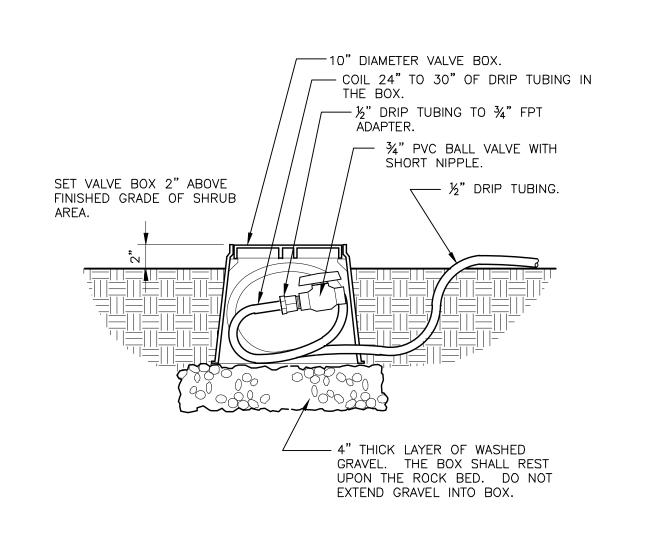
9 HUNTER HC CONTROLLER WALL MOUNT

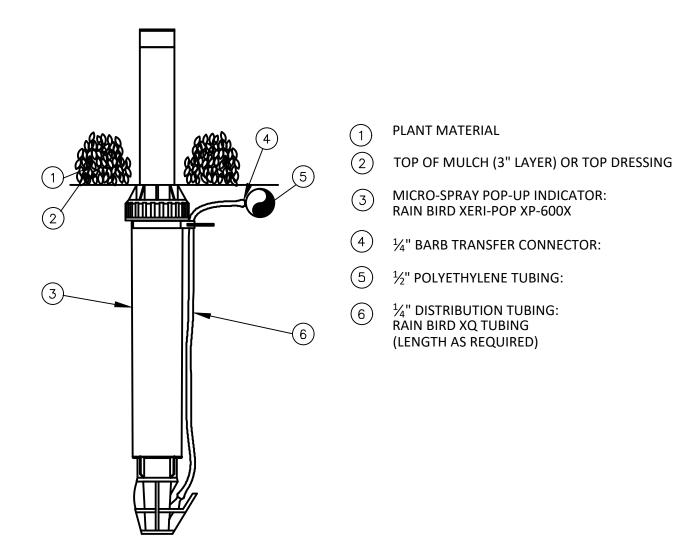
1" = 1'-0"

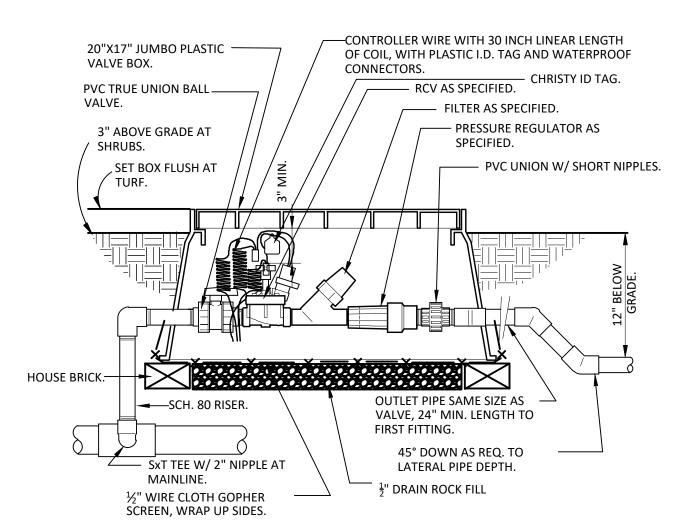
Know what's **below**. **Call** before you dig.











DRIP FLUSH VALVE

1. INSTALL RAIN BIRD DRIP INDICATOR AT ALL END OF DRIP ZONE SYSTEM SO THAT USER CAN DETERMINE ZONE LIMITS AND ZONE OPERATING PRESSURES.

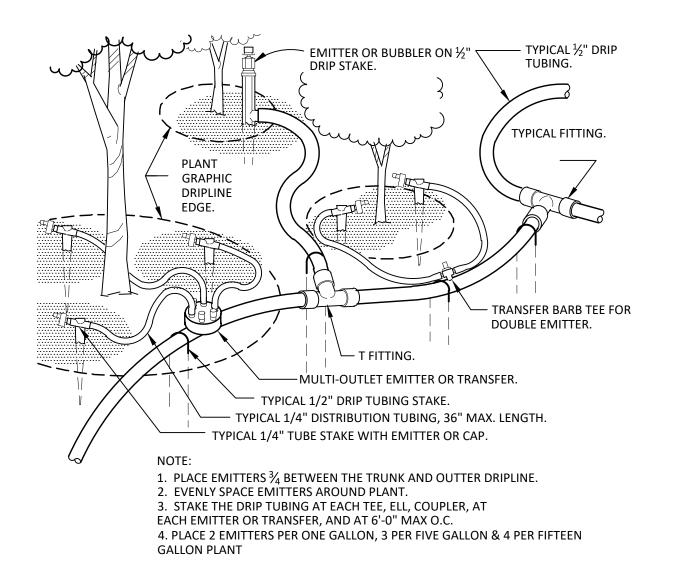
1" DRIP VALVE/FILTER/REGULATOR

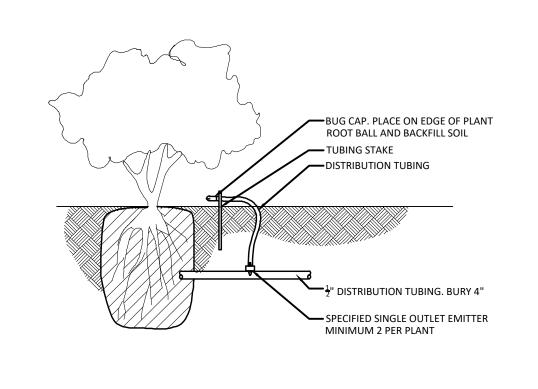
AB-IR-DRI-03

AB-IR-DRI-24

AB-IR-DRI-VALV-328413-02

INSERT FITTING: 1/4-INCH SELF-PIERCING EMITTER ■ 1/4-INCH TUBING: POLYETHYLENE DISTRIBUTION TUBING TOP OF MULCH BUG CAP. PLACE ON EDGE OF PLANT ROOT BALL AND BACKFILL - 1/2-INCH POLYETHYLENE TUBING: SAND, 36" IN LOAM OR CLAY • 1/4-INCH TUBING STAKE: EASY FIT COMPRESSION OR (LENGTH AS REQUIRED) THREADED BARB FITTING





1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. 2. DO NOT SCALE DRAWING. 3. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.

PVC TO DRIP EMITTER 1/2" POLY TUBING

TYPICAL DRIP TUBING

FINISH GRADE

PVC HEADER

COMPACTED SUBGRADE

DRIP LINE SIZED TEE (TYP)

SPECIFIED DRIPLINE

— DRIP LINE TO PVC CONNECTION (TYP) DRIP EMITTER DETAIL

AB-IR-DRI-14

**O** FINISH GRADE.

② DEPTH OF TUBING PER

DEPTH OF PVC SUPPLY

MANIFOLD PER - 12"

© POLY TUBING, LENGTH AS

**⊘** TORO LOC-EZE X 1/2" MTP

**③** PVC TEE (SxSxT) WITH 1/2"

ADAPTER (FAM16).

**①** TORO LOC-EZE TEE.

**O DRIPLINE LATERAL** 

NECESSARY.

**SPECIFICATIONS** 

ON-SURFACE DRIPLINE: INLINE DRIP EMITTER OUTLET, SEE IRRIGATION LEGEND FOR DRIPLINE OUTLET SPACING. BARB OR TWIST TEE

AB-IR-DRI-23

BARB OR TWIST LOCK COUPLING

BARB OR TWIST LOCK ELBOW BARB OR TWIST LOCK MALE ADAPTER

PVC TEE SxSxT

PVC LATERAL SUPPLY HEADER TIE DOWN STAKE:

FINISH GRADE

BLANK TUBING LENGTH AS REQUIRED

3" LAYER OF MULCH

SEE PLANS AND LEGEND FOR ALL DIMENSIONS AND DRIPLINE SPACING. RATIO OF DRIPLINES TO START CONNECTIONS IS SHOWN AT 2:1, BUT MAY VARY PER HYDRAULIC DEMAND

SEE LAYOUT OF PLANTING

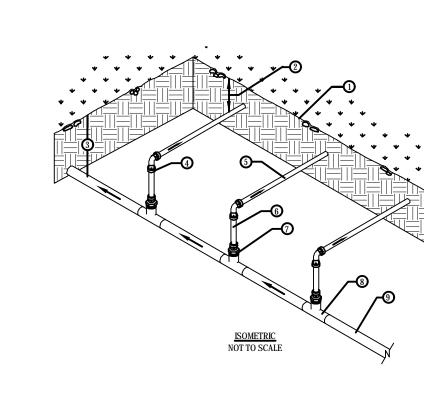
SPACES FOR LAYOUT

SUGGESTIONS

ON START CONNECTIONS. SEE PLANS AND LEGEND.

NOTES:

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. 3. ALL DIMENSIONS ARE CONSIDERED TRUE AND REFLECT MANUFACTURER'S SPECIFICATIONS. 4. CONTRACTOR'S NOTE: CONSULT MANUFACTURER FOR INSTALLATION RECOMMENDATIONS



FPT OUTLET. PVC SUPPLY MANIFOLD FROM DRIP ZONE KIT.

DRIP END FEED HEADER





Revision/Issue

Firm Name and Address LIC#1012730 IA CERT # 57436

Project Name and Address COLUMBUS ST. EL GRANADA, CA

Drawn By 236-2019 4BInc. Checked By Approved By

PVC SUPPLY LINE TO DRIP LINE TRANSITION DETAIL

1. PLACE TIE DOWN STAKES EVERY TWO FEET IN SAND, THREE FEET IN LOAM, AND

2. AT FITTINGS WHERE THERE IS A CHANGE OF DIRECTION SUCH AS TEES OR ELBOWS,

FOUR FEET IN CLAY.

USE TIE-DOWN STAKES ON

EACH LEG OF THE CHANGE OF DIRECTION.

SUB SURFACE HEADER INSTALLATION

AB-IR-DRI-13

AB-IR-DRI-INLI-11

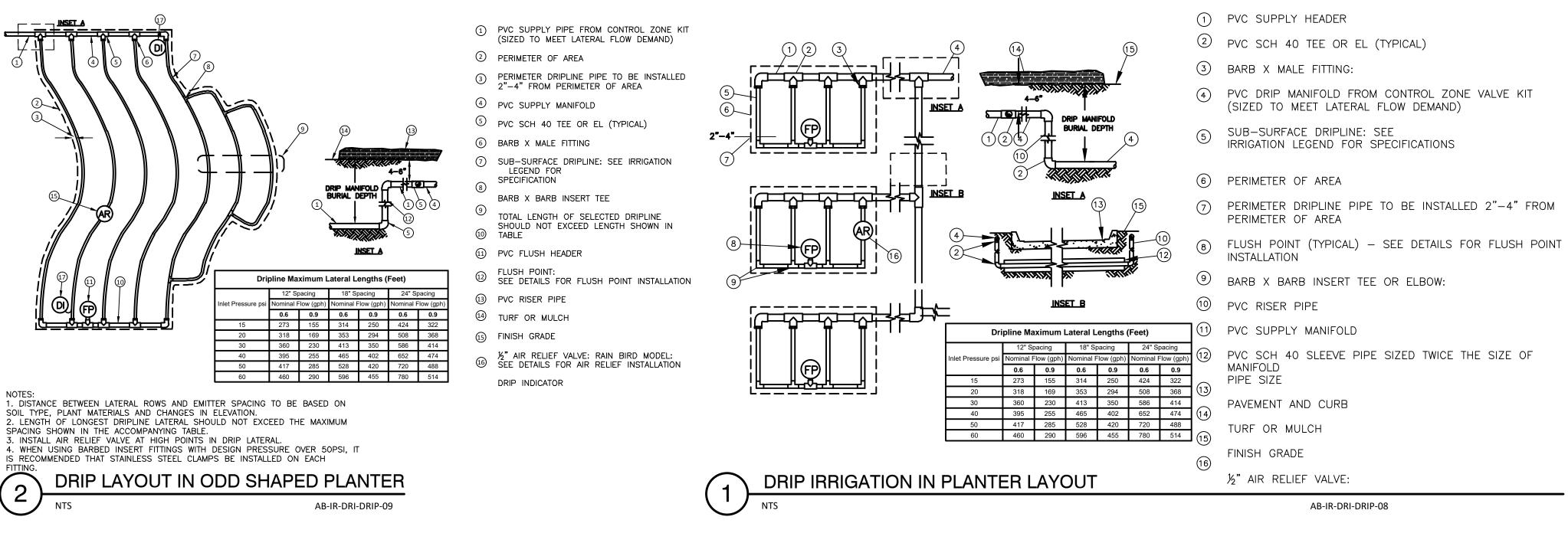
AB-IR-DRI-INLI-06

Know what's below.



General Notes

IR-3.0



NOTES TO INSTALLER:

PER MANUFACTURER'S

AND SPREAD SURFACE

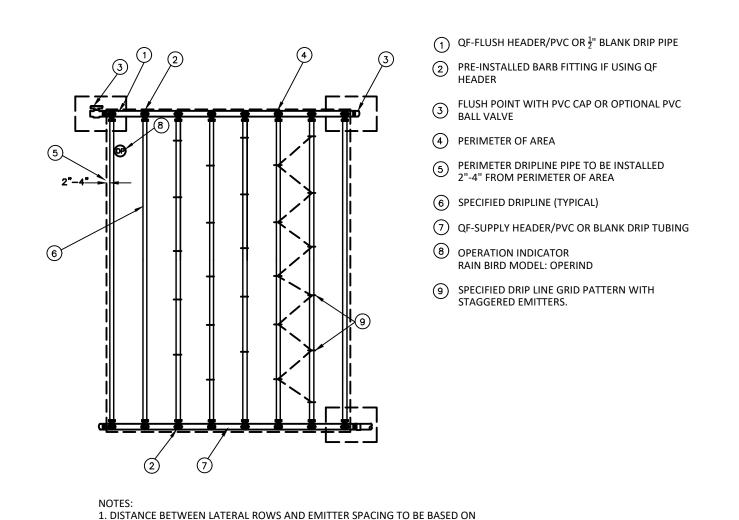
3. INSTALL DRIP LINE IN

GUIDELINES.

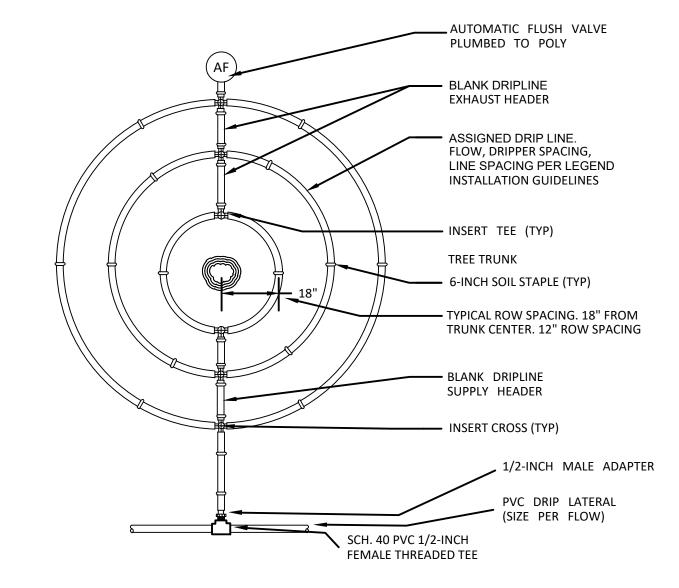
TOTAL FLOW OF

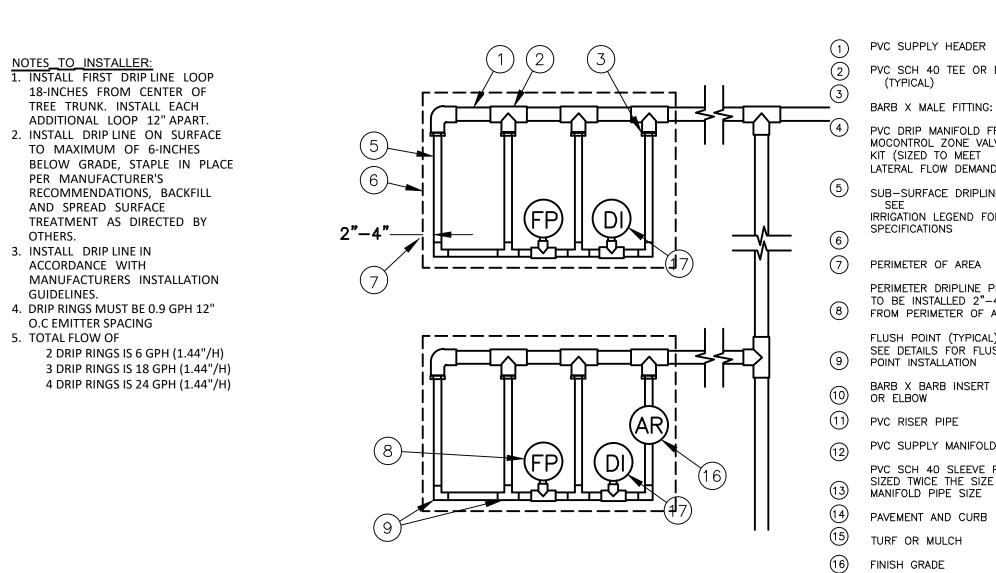
ACCORDANCE WITH

O.C EMITTER SPACING



SOIL TYPE, PLANT MATERIALS AND CHANGES IN ELEVATION.





(TYPICAL) BARB X MALE FITTING: PVC DRIP MANIFOLD FROM MOCONTROL ZONE VALVE KIT (SIZED TO MEET LATERAL FLOW DEMAND) SUB-SURFACE DRIPLINE: IRRIGATION LEGEND FOR SPECIFICATIONS PERIMETER OF AREA PERIMETER DRIPLINE PIPE TO BE INSTALLED 2"-4" 8) FROM PERIMETER OF AREA FLUSH POINT (TYPICAL) -SEE DETAILS FOR FLUSH POINT INSTALLATION BARB X BARB INSERT TEE OR ELBOW 11) PVC RISER PIPE PVC SUPPLY MANIFOLD PVC SCH 40 SLEEVE PIPE SIZED TWICE THE SIZE OF MANIFOLD PIPE SIZE PAVEMENT AND CURB TURF OR MULCH FINISH GRADE (17) ½" AIR RELIEF VALVE

PVC SCH 40 TEE OR EL

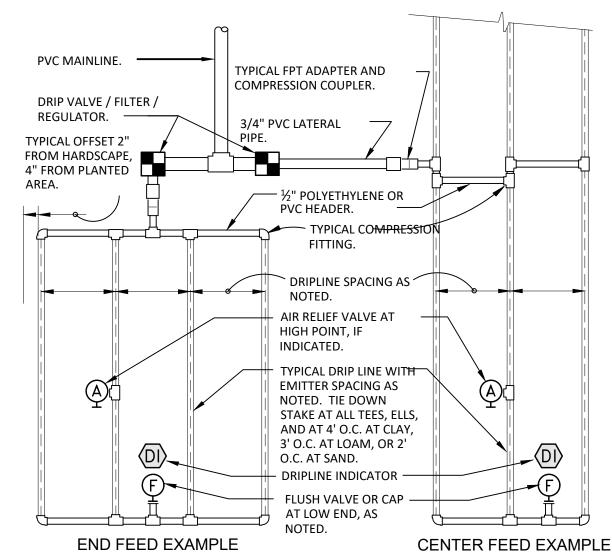






AB-IR-DRI-DRIP-15

DRIP INDICATOR



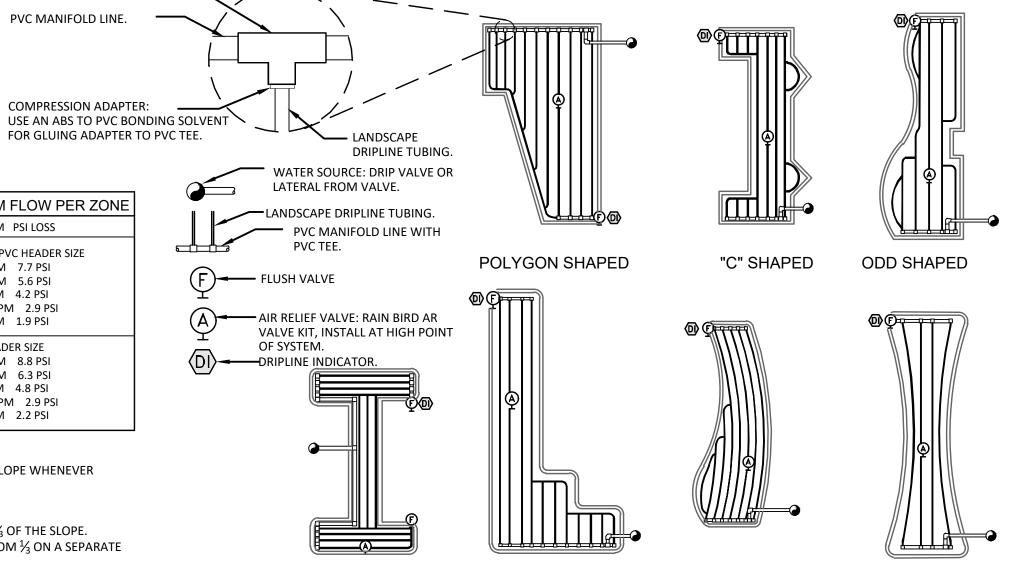
PSI 12" SPACING 18" SPACING 0.6 0.9 0.9 0.6 0.9 0.6 0.9 0.9 0.6 0.9 0.9 0.6 0.9 0.9 0.6 0.9 0.6 0.9 0.9 0.6 0.9 0.9 0.6 0.9 0.9 0.6 0.9 0.9 0.0 0.0 0.9 0.0 0.9 0.0 0.0 0.9 0.0 0.0				`	
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20     249     191     350     171     442     340       30     307     236     434     333     550     422       40     350     268     495     380     627     171       50     125     96     175     135     218     171	PSI				
	20 30 40 50	249 191 307 236 350 268 125 96	350 171 434 333 495 380 175 135	4 5 6 2	42 340 50 422 27 171 18 171
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MAXIMUM LATERAL LENGTH (FEET)

M FLOW PER ZONE EMITTER FLOW RATE MAX GPM PSI LOSS EMITTER LATERAL SPACING | SPACING SCHEDULE 40 PVC HEADER SIZE 1/2" 4.7 GPM 7.7 PSI 0.96 0.69 0.28 1.44 3/4" 8.3 GPM 5.6 PSI 1.03 1" 13.5 GPM 4.2 PSI 0.41 1-1/2" 33.9 GPM 2.9 PSI 52.4 GPM 1.9 PSI LATERAL FLOW PER 100 FT (GPM) POLY PIPE HEADER SIZE 1/2" 4.7 GPM 8.8 PSI EMITTER 12" 18" 24" FLOW SPACING SPACING SPACING 3/4" 8.3 GPM 6.3 PSI 13.5 GPM 4.8 PSI 1-1/2" 31.8 GPM 2.9 PSI 
 0.6 GPH
 1.0 GPM
 0.67 GPM
 0.50 GPM

 0.9 GPH
 1.5 GPM
 1.0 GPM
 0.75 GPM
 2" 52.4 GPM 2.2 PSI SLOPED CONDITION NOTE: 1. DRIPLINE LATERALS SHOULD FOLLOW THE CONTOURS OF THE SLOPE WHENEVER

INSTALL AIR RELIEF VALVE AT HIGHEST POINT. NORMAL SPACING WITHIN THE TOP ⅓ OF SLOPE, INSTALL DRIPLINE AT 25% GREATER SPACING AT THE BOTTOM  $\frac{1}{3}$  OF THE SLOPE. WHEN ELEVATION CHANGE IS 10 FT OR MORE, ZONE THE BOTTOM  $\frac{1}{3}$  ON A SEPARATE



CORNER SHAPED

DOGBONE SHAPED

"C" SHAPED	ODD SHAPED
CURVED POLYGON	HOURGLASS SHAPED

General Notes

\_\_\_\_ <

<b>70.</b>	Revision/Issue	Date

Firm Name and Address Experienced professionals, Efficient solutions. LIC#1012730 IA CERT # 57436

Project Name and Address COLUMBUS ST. EL GRANADA, CA

Project	Drawn By
236-2019	4BInc.
Date	Checked By
9/10/19	4BInc.
Scale	Approved By
	Sheet
	IIR-3.1

TYPICAL DRIPLINE REQUIREMENTS

AB-IR-DRI-DRIP-19

Call before you dig.

Know what's below.

### 1.1 SUMMARY

A. Irrigation system required for this work includes but is not limited to the furnishing of all labor, tools, materials, appliances, tests, permits, taxes, etc., necessary for the installation of a landscape irrigation system as herein specified and shown on the drawings, and the removal of all debris from the site

1. Locate, purchase, deliver and install piping, conduit, sleeves, 120 volt and low voltage electrical and water connections, valves, backflow preventer devices, controllers, rain sensors, spray and bubbler heads, drip irrigation lines, and associated accessories for a fully operational automatic irrigation system 2. Trenching and water settling of backfill material.

3. Testing and startup of the irrigation system

4. Prepare an as built record set of drawings. 5. Training of the Owner's maintenance personnel in the operational requirements of the Irrigation system.

6. Clean up and disposal of all excess and surplus material.

7. Maintenance of the irrigation system during the proscribed maintenance period.

B. The system shall efficiently and evenly irrigate all areas and be complete in every respect and shall be left ready for operation to the satisfaction of the Owner's

C. Coordinate with other trades, as needed to complete work, including but not limited to Water Meter, Point of Connection (POC) and Backflow Preventer Device (BEPD) location and electrical hookups 1.2 CONTRACT DOCUMENTS

A. Shall consist of specifications and its general conditions and the drawings. The intent of these documents is to include all labor, materials, and services necessary for the proper execution of the work. The documents are to be considered as one. Whatever is called for by any part shall be as binding as if called for

1.3 RELATED DOCUMENTS AND REFERENCES

A. Related Documents: Refer to Landscape Documents or Landscape Architect provided documentation and specifications

1. American Society of Testing Materials (ASTM): cited section numbers

2. National Sanitation Foundation (NSF): rating system

3. Irrigation Association: Turf & Landscape Irrigation Best Management Practices 1.4 VERIFICATION

A. Irrigation piping and related equipment are drawn diagrammatically. Scaled dimensions are approximate only. Before proceeding with work, carefully check and verify dimensions and immediately notify the Owner's Representative of discrepancies between the drawings or specifications and the actual conditions Although sizes and locations of plants and or irrigation equipment are drawn to scale wherever possible, it is not within the scope of the drawings to show all necessary offsets, obstructions, or site conditions. The Contractor shall be responsible to install the work in such a manner that it will be in conformance to site

B. Piping and equipment is to be located within the designated planting areas wherever possible unless specifically defined or dimensioned otherwise.

A. The Contractor shall obtain and pay for all permits related to this section of the work unless previously excluded under provision of the contract or general conditions. The Contractor shall comply with all laws and ordinances bearing on the operation or conduct of the work as drawn and specified. If the Contractor observes that a conflict exists between permit requirements and the work outlined in the contract documents, the Contractor shall promptly notify the Owner's resentative in writing including a description of any necessary changes and changes to the contract price resulting from changes in the work.

B. Wherever references are made to standards or codes in accordance with which work is to be performed or tested, the edition or revision of the standards and codes current on the effective date of this contract shall apply, unless otherwise expressly set forth C. In case of conflict among any referenced standards or codes or between any referenced standards and codes and the specifications, the more restrictive

standard shall apply or Owner's Representative shall determine which shall govern 1.6 PROTECTION OF WORK, PROPERTY AND PERSON

A. The Contractor shall adequately protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to the Contractor's 1.7 CHANGES IN THE WORK

A. The Owner's Representative may order changes in the work, and the contract sum being adjusted accordingly. All such orders and adjustments plus claims by the Contractor for extra compensation must be made and approved in writing before executing the work involved

B. All changes in the work, notifications and Contractor's request for information (RFI) shall conform to the contract general condition requirements.

A. The Contractor shall re-execute any work that fails to conform to the requirements of the contract and shall remedy defects due to faulty materials or workmanship upon written notice from the Owner's Representative, at the soonest as possible time that can be coordinated with other work, and seasonal weather demands, but not more than 90 (ninety) days after notification.

A. Owner's Representative: The person appointed by the Owner to represent their interest in the review and approval of the work and to serve as the contracting authority with the Contractor. The Owner's Representative may appoint other persons to review and approve any aspects of the work. B. Substantial Completion Acceptance: The date at the end of the Planting, Planting Soil, and Irrigation installation where the Owner's Representative accepts that

all work in these sections is complete and the Warranty period has begun. This date may be different that the date of substantial completion for the other C. Final Acceptance: The date when the Owner's Representative accepts that the plants and work in this section meet all the requirements of specification. It is intended that the materials and workmanship warranty for Planting, Planting Soil, and Irrigation work run concurrently.

A. See the contract General Conditions for policy and procedures related to submittals.

B. Product data

1. Submit a minimum of (3) complete lists of all irrigation equipment to be used, manufacturer's brochures, maintenance manuals, warrantees and operating instructions, within 15 days after the notice to proceed

a. This submission may be done digitally and all documents shall be submitted in one PDF document. 2. The submittals shall be packaged and presented in an organized manner, in the quantity described in Division 1 of the specifications. Provide a table of

3. Clearly identify on each submitted sheet by underlining or highlighting (on each copy) the specific product being submitted for approval. Failure to clearly identify the specific product being submitted will result in a rejection for the entire submittal. No substitutions of material or procedures shall be made concerning these documents without the written consent of an accepted equivalent by the Owner's Representative. 4. Equipment or materials installed or furnished without prior approval of the Owner's Representative, may be rejected by the Owner's Representative and the

Contractor shall be required to remove such materials from the site at their own expense. 5. Approval of substitution of material and/or products, other than those specified shall not relieve the Contractor from complying with the requirements of the contract documents and specifications. The Contractor shall be responsible, at their own expense, for all changes that may result from the approved substitutions, which affect the installation or operations other items of their own work and/or the work of other Contractor

C. Samples: Samples of the equipment may be required at the request of the Owner's Representative if the equipment is other than that specified

D. Other Submittals: Submit for approval

1. Documentation of the installer's qualifications 2. As built record set of drawings.

3. Testing data from all required pressure testing.

4. Backflow prevention device certification: Certification from the manufacturer or their representative that the back flow prevention device has been installed correctly according to the manufactures requirements

5. Booster pump certification: Certification from the manufacturer or their representative that the booster pump has been installed correctly according to the manufacturer's requirements 6. Irrigation controller certification: Certification from the manufacturer or an authorized distributor that the Controller has been installed correctly according to the

1.11 OBSERVATION OF THE WORK

manufactures requirements.

A. The Owner's Representative may inspect the work at any time. They may remove samples of materials for conformity to specifications. Rejected materials shall be immediately removed from the site and replaced at the Contractor's expense. The cost of testing materials not meeting specifications shall be paid by the

B. The Owner's Representative shall be informed of the progress of the work so the work may be observed at the following key times in the construction process The Owner's Representative shall be afforded sufficient time to schedule visit to the site. Failure of the Owner's Representative to make field observations shall not relieve the Contractor from meeting all the requirements of this specification.

1. Trenching, directional boring, and sleeving review.

Hydrostatic pressure testing. 3. Adjustment and coverage test.

4. Pre-maintenance observation

performance of the contract.

Final acceptance / system malfunction corrections.

1.12 PRE-CONSTRUCTION CONFERENCE A. Schedule a pre-construction meeting with the Owner's Representative at least seven (7) days before beginning work to review any questions the Contractor may have regarding the work, administrative procedures during construction and project work schedule. 1 13 QUALITY ASSURANCE

A. It is the intention of this specification to accomplish the work of installing an automatic irrigation system, which will operate in an efficient and satisfactory manner. The irrigation system shall be installed and made operational according to the workmanlike standards established for landscape installation and sprinkler irrigation operation as set forth by the most recent Best Management Practices (BMP) of the Irrigation Association.

B. The specification can only indicate the intent of the work to be performed rather than a detailed description of the performance of the work. It shall be the responsibility of the Contractor to install said materials and equipment in such a manner that they shall operate efficiently and evenly and support optimum plant growth and health. C. The Owner's Representative shall be the sole judge of the true intent of the drawings and specifications and of the quality of all materials furnished in

D. The Contractor shall keep one copy of all drawings and specifications on the work site, in good order. The Contractor shall make these documents available to the Owner's Representative when requested E. In the event of any discrepancies between the drawings and the specification, the final decision as to which shall be followed, shall be made by the Owner's

F. In the event the installation is contradictory to the direction of the Owner's Representative, the installation shall be rectified by the Contractor at no additional cost to the Owner. The Contractor shall immediately bring any such discrepancies to the attention of the Owner's Representative

G. It shall be distinctly understood that no oral statement of any person shall be allowed in any manner to modify any of the contract provisions. Changes shall be made only on written authorization of the Owner's Representative H. Installer Qualifications: The installer shall be a firm having at least 5 years of successful experience of a scope similar to that required for the work.

a. Installer Field Supervision: The installer shall maintain on site an experienced full-time supervisor who can communicate in English with the Owner's b. Submit the installer's qualifications for approval.

1.14 IRRIGATION SYSTEM WARRANTY:

1.16 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall Warrantee all workmanship and materials for a period of 1 year (s) following the acceptance of the work.

6. Any parts of the irrigation work that fails or is defective shall be replaced or reconstructed at no expense to the Owner including but not limited to: restoring grades that have settled in trenches and excavations related to the work. Reconstruction shall include any plantings, soil, mulch or other parts of the constructed landscape that may be damaged during the repair or that results from soil settlement

B. The date of acceptance of the work and start of the Guarantee period shall be determined by the Owner's Representative, upon the finding that the entire irrigation system is installed as designed and specified, and found to be operating correctly, supplying water evenly to all planting and/or lawn areas.

C. The system controller shall be warranted by the equipment manufacturer against equipment malfunction and defects for a period of 5 years, following the D. Neither the final acceptance nor any provision in the contract documents shall relieve the Contractor of responsibility for faulty materials or workmanship. The Contractor shall remedy any defects within a period of 7 days (s) from the date of notification of a defect.

1.15 SITE CONDITIONS A. It is the responsibility of the Contractor to be aware of all surface and sub-surface conditions, and to notify the Owner's Representative, in writing, of any cumstances that would negatively impact the installation of the work. Do not proceed with work until unsatisfactory conditions have been corrected

A. All materials and equipment shall be stored properly and protected as required by the Contractor. The Contractor shall be entirely responsible for damages or loss by weather or other cause to work under the contract. Materials shall be furnished in ample quantities and at such times as to ensure uninterrupted progress

B. Deliver the products to the job site in their original unopened container with labels intact and legible at time of use.

including the selection of a Contractor to undertake the repair or maintenance. Repairs shall be at no cost to the owne

C. Store in accordance with the manufacturers' recommendations.

A. The Contractor shall continuously maintain adequate protection of all their work from damage, destruction, or loss, and shall protect the owner's property from damage arising in connection with this contract. Contractor shall make good any such damage, destruction, loss or injury. Contractor shall adequately protect adjacent property as provided by law and the contract documents.

B. The Contractor shall maintain sufficient safeguards, such as railings, temporary walks, lights, etc., against the occurrence of accidents, injuries or damage to any person or property resulting from their work, and shall alone be responsible for the same if such occurs

C. All existing paving, structures, equipment or plant material shall be protected at all times, including the irrigation system related to plants, from damage by workers and equipment. The Contractor shall follow all protection requirements including plant protection provision of the general contract documents. All damages shall be repaired or replaced at the Contractor's expense. Repairs and or replacement shall be to the satisfaction of the Owner's Representative,

1. For trees damaged to the point where they will not be expected to survive or which are severely disfigured and that are too large to replace, the cost of damages shall be as determined by the Owner's arborist using accepted tree value evaluation method D. The Contractor shall refrain from trenching within the drip line of any existing tree to remain. The Owner's Representative may require the Contractor to relocate proposed irrigation work, bore lines beneath roots or use air spade technology to dig trenches through and under the root system to avoid damage to existing

1.18 EXCAVATING AROUND UTILITIES A. Contractor shall carefully examine the civil, record, and survey drawings to become familiar with the existing underground conditions before digging. 1. Do not begin any excavation until all underground utilities have been located and marked

Determine location of underground utilities and perform work in a manner that will avoid possible damage. Hand excavate, as required. Maintain stakes and or markings set by others until parties concerned mutually agree to their removal. B. Notification to 811 is required for all excavation around utilities. The Contractor is responsible for knowing the location and avoiding utilities that are not covered

C. Section 4216/4217 of the government code requires a dig-alert identification number be issued before a "permit to excavate" will be valid. For your dig-alert identification number call underground service alert toll free 1-800-422-4133 two working days before beginning construction.

1.19 POINT OF CONNECTION

Point of connection option 1 - Irrigation Contractor provided

A. The point of connection of the irrigation system to its electrical power sources shall be provided by the irrigation installer. All connections shall be made by a licensed electrical Contractor per governing codes at the location shown on the drawings.

B. The point of connection of the irrigation system to its potable and or non-potable water sources, including the main shutoff valve and backflow preventer shall be provided by the irrigation installer. All connections shall be made by a licensed Contractor per governing codes, at the location shown on the drawings. Point of connection option 2 - General Contractor provided

A. The point of connection of the irrigation system to its electrical power sources shall be provided by the General Contractor's licensed electrical Contractor per governing codes at the location shown on the drawings. The irrigation Contractor will connect the power to provided junction box or grounded plug receptacle.

B. The point of connection of the irrigation system to its potable and or non-potable water sources, including the main shutoff valve and backflow preventer shall be provided by the General Contractor's licensed plumbing Contractor per governing codes at the location shown on the drawings. The minimum size and water pressure of the pressurized line will be as noted on the irrigation drawing.

A. All temporary piping, wiring, meters, panels and other related appurtenances required between source of supply and point of use shall be provided by the

Contractor and coordinated with the Owner's Representative. Existing utilities may be used with the written permission of the owner. 1.21 CUTTING, PATCHING, TRENCHING AND DIGGING

A. The Contractor shall do all cutting, fitting, trenching or patching of their work that may be required to make its several parts come together as shown upon, or implied by, the drawings and specifications for the completed proje B. Digging and trenching operations shall be suspended when the soil moisture is above field capacity.

1.22 USE OF PREMISES

1.20 TEMPORARY UTILITIES

A. The Contractor shall confine their apparatus; the storage of materials, and the operations of their workers to limits indicated by the law, ordinances, or permits and shall not unreasonably encumber the premises with their materials

B. Contractor parking, and material and equipment storage shall in areas approved by the Owner's Representative. 1.23 AS BUILT RECORD SET OF DRAWINGS

A. Immediately upon the installation of any buried pipe or equipment, the Contractor shall indicate on the progress record drawings the locations of said pipe or

B. Before final acceptance of work, the Contractor shall provide an as built record set of drawings showing the irrigation system work as built. The drawings shall be transmitted to the Owner's Representative in paper format and as a pdf file of each document on compact disk or flash drive. The drawings shall include all information shown on the original contract document and revised to reflect all changes in the work. The drawings shall include the following additional information

1. All valves shall be numbered by station and corresponding numbers shall be shown on the as built record set of drawings 2. All main line pipe or irrigation equipment including sleeves, valves, controllers, irrigation wire runs which deviate from the mainline location, backflow preventers, remote control valves, grounding rods, shut-off valves, rain sensors, wire splice locations, and quick coupling valves shall be located by two (2) measured dimensions, to the nearest one-half foot. Dimensions shall be given from permanent objects such as buildings, sidewalks, curbs, walls, structures and driveways. All changes in direction and depth of main line pipe shall be noted exactly as installed. Dimensions for pipes shall be shown at no greater than

3. As built record set of drawings shall be signed and dated by the Contractor attesting to and certifying the accuracy of the as built record set of drawings. As built record set of drawings shall have "As Built Record Set of Drawings", company name, address, phone number and the name of the person who created the drawing and the contact name (if different).

C. The Owner shall make the original contract drawing files available to the Contractor.

1.24 CONTROLLER CHARTS:

1. On the inside surface of the cover of each automatic controller, prepare and mount a color-coded chart showing the valves, main line, and systems serviced by that particular controller. All valves shall be numbered to match the operation schedule and the drawings. Only those areas controlled by that controller shall be shown. This chart shall be a plot plan, entire or partial, showing building, walks, roads and walls. The plan, reduced as necessary and legible in all details, shall be made to a size that will fit into the controller cover. This print shall be approved by the Owner's Representative and shall be protected in ated in a plastic cover and be secured to the inside back of the controller cabinet doc

2. The controller chart shall be completed and approved prior to acceptance of the work.

A. Provide all required system testing with written reports as described in part 3.

1.26 OPERATION AND MAINTENANCE MANUALS AND GUARANTEES A. Prepare and deliver to the Owner's Representative within ten calendar days prior to completion of construction, two 3-ring hard cover binders containing the

following information: 1. Index sheet stating Contractor's address and telephone number, list of equipment with name and addresses of local manufacturers' representatives.

2. Catalog and parts sheets on all material and equipment.

3. Guarantee statement. The start of the guarantee period shall be the date the irrigation system is accepted by the Owner. 4. Complete operating and maintenance instruction for all major equipment.

Irrigation product manufacturers warrantees. B. In addition to the above-mentioned maintenance manuals, provide the Owner's maintenance personnel with instructions for maintaining major equipment and

PART 2 PRODUCTS

2.3 PIPING MATERIAL

2.1 MATERIALS GENERAL A. All materials shall be of standard, approved and first grade quality and shall be new and in perfect condition when installed and accepted.

show evidence in writing to the Owner's Representative at the conclusion of the project that this has been rendered.

B. See the parts schedule on the drawings for specific components and manufacturers. The use of a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and configuration desired only. Other manufacturer's equipment may be submitted for approval with written approval by the Owner's Representative. Substituted equipment shall not substantially alter the operations of the syster

C. Approval of any items or substitutions indicates only that the product(s) apparently meet the requirements of the drawings and specifications on the basis of the information or samples submitted. The Contractor shall be responsible for the performance of substituted items. If the substitution proves to be unsatisfactory or not compatible with other parts of the system, the Contractor shall replace said items with the originally specified items, including all necessary work and modifications to replace the items, at no cost to the owner.

2.2 RECLAIMED WATER SYSTEM DESIGNATION

gasket Class 315.

A. Where irrigation systems use reclaimed water, all products including valve boxes, lateral and main line pipe, etc. where applicable and/or required by local code shall have the reclaimed water purple color designation

A. Individual types of pipe and fittings supplied are to be of compatible manufacturer unless otherwise approved. Pipe sizes shown are nominal inside diameter unless otherwise noted. B. Plastic pipe: 1. All pipe shall be free of blisters, internal striations, cracks, or any other defects or imperfections. The pipe shall be continuously and permanently marked with

the following information: manufacturer's name or trade mark, size, class and type of pipe pressure rating, quality control identifications, date of extrusion, and National Sanitation Foundation (NSF) rating. 2. Pressure main line for piping upstream of remote control valves and guick coupling valves:

a. Pipe smaller than 2 inch diameter shall be plastic pipe for use with solvent weld or threaded fittings. Shall be manufactured rigid virgin polyvinyl chloride (PVC) 1220, Type 1, Grade 2 conforming to ASTM D 1785, designated as Schedule 40 b. Pipe 2 - 3 inch diameter shall be manufactured rigid virgin polyvinyl chloride (PVC), Type 1, Grade 2 conforming to ASTM D 1785, designated as bell

c. Pipe larger than 3 inch diameter shall be manufactured rigid virgin polyvinyl chloride (PVC), Type 1, Grade 2 conforming to ASTM D 1785, designated as 3. Non\_pressure lateral line for piping downstream of remote control valves: plastic pipe for use with solvent weld or threaded fittings. Shall be manufactured rigid virgin polyvinyl chloride PVC 1220 (type 1, grade 2) conforming to ASTM d 1785, designated as Class 200, 3/4 minimum size.

C. Galvanized pipe shall be used for above ground connections to, backflow prevention device assemblies, hose bibs, and booster pumps and as shown on the

1. Pipe shall be hot dip galvanized continuous welded, seamless, Schedule 40 conforming to applicable current ASTM standards. 2.4 FITTINGS AND CONNECTIONS:

A. Polyvinyl chloride pipe fittings and connections: Type II, Grade 1, Schedule 40, high impact molded fittings, manufactured from virgin compounds as specified for piping tapered socket or molded thread type, suitable for either solvent weld or screwed connections. Machine threaded fittings and plastic saddle and flange fittings are not acceptable. Furnish fittings permanently marked with following information: nominal pipe size, type and schedule of material, and National Sanitation Foundation (NSF) seal of approval. PVC fittings shall conform to ASTM D2464 and D2466. B. Brass pipe fittings, unions and connections: standard 125 pound class 85% red brass fittings and connections, IPS threaded

C. PVC Schedule 80 threaded risers and nipples: Type I, grade 1, Schedule 80, high impact molded, manufactured from virgin compounds as specified for piping and conforming to ASTM D-2464. Threaded ends shall be molded threads only. Machined threads are not acceptable D. Galvanized pipe fittings shall be galvanized malleable iron ground joint Schedule 40 conforming to applicable current ASTM standards.

2.5 SOLVENT CEMENTS AND THREAD LUBRICANT A. Solvent cements shall comply with ASTM D2564. Socket joints shall be made per recommended procedures for joining PVC plastic pipe and fittings with PVC solvent cement and primer by the pipe and fitting manufacturer and procedures outlined in the appendix of ASTM D2564

B. Thread lubricant shall be Teflon ribbon-type, or approved equal, suitable for threaded installations as per manufacturer's recommendations C. Pipe Joint Compound (Pipe dope) shall be used on all galvanized threaded connections. Pipe Joint Compound is a white colored, non-separating thread sealant compound designed to seal threaded connections against leakage due to internal pressure. It shall contain PTFE (Polytetrafluoroethylene) to permit a tighter assembly with lower torque, secure permanent sealing of all threaded connections and allow for easy disassembly without stripping or damaging threads.

A. The backflow prevention device shall be certified to NSF/ANSI 372 shall be ASSE Listed 1013, rated to 180 degree F, and supplied with full port ball valves.

B. The main body and access covers shall be low lead bronze (ASTM B 584)

C. The seat ring and all internal polymers shall be NSF Listed Noryl and the seat disc elastomers shall be silicone

D. Backflow Preventer shall be as indicated on the drawings.

2.7 PRESSURE REGULATOR A. Pressure regulator shall certified to NSF/ANSI 372, consisting of low lead bronze body bell housing, a separate access cap shall be threaded to the body and

B. The main valve body shall be cast bronze (ASTM B 584). C. The access covers shall be bronze (ASTM B 584 or Brass ASTM B 16)

D. The assembly shall be of the balanced piston design and shall reduce the pressure in both flow and no flow conditions. E. Pressure regulator shall be as indicated on the drawings.

A. Strainer shall conform to MIL -S-16293, and be ANSI 3rd party certified to comply with the states lead plumbing law 0.25% maximum weighted average lead

C. The access covers shall be yellow brass or cast bronze (ASTM B 16 or ASTM B 584)

B. The main body shall be low lead bronze (ASTM B 584)

D. Strainer screen shall be 300 series stainless steel available in 20, 40, 60, 80, or 100 mesh. F. Wye strainer shall be as indicated on the plans

G. 2.8 BACKFLOW PREVENTER CAGE & FROST BLANKET H. A heavy-duty steel mesh cage with rust proof finish. The caging shall be sized to allow space for the entire piping assembly associated with the Backflow

Preventer unit, and all associated equipment. I. The cage shall include the manufacturers' standard tamper proof locking mechanism. J. Provide a concrete base as detailed on the drawings.

K. Backflow Preventer Cage type, manufacturer and color shall be as indicated on the plans. L. A Frost Blanket, manufacturer and color shall be as indicated on the plans.

2.9 BOOSTER PUMP (where applicable)

2.11 CHECK VALVES

B. Booster pump shall be as indicated on the drawings

A. Ball valves for 3/4 inch through 2 - 1/2 inch shall be of PVC, block, tru-union design with EDPDM seals and o-ring.

A. Booster pump shall be housed in a sturdy, locking, weather-resistant case, furnished for maximum exterior protection.

2.10 BALL VALVES

Anti-drain valves shall be field adjustable against draw out from 5 to 40 feet of head.

B. Ball valves for 3 inch and larger shall be gate design and shall be iron body, brass or bronze mounted AWWA gate valves, and shall have a clear waterway equal to the full nominal diameter of the valve, and shall be rubber gasket, flanged or mechanical joint only, and shall be able to withstand a continuous working pressure of 150 PSI. Valve shall be equipped with a square-operating nut.

C. All ball valves located in a valve manifold shall be the same size as the main line (1-1/2 inch size minimum). Provide pipe-reducing adapters down stream of valves, as required. All ball valves in line shall be the same size as the pipe. D. Ball valves shall be as indicated on the drawings.

B. Anti\_drain valves shall be of heavy-duty virgin PVC construction with female iron pipe thread inlet and outlet. Internal parts shall be stainless steel and neoprene.

A. Swing check valves 2 inch and smaller shall be 200 lbs., W.O.G., bronze construction with replaceable composition, neoprene or rubber disc and shall meet or exceed federal specification WW-V-5ld, class a, type is

C. Check valves shall be as indicated on the drawings. 2.12 REMOTE CONTROL VALVES

A. Remote control valves shall be electrically operated, single seat, normally closed configuration, equipped with flow control adjustment and capability for manual B. Valves shall be actuated by a normally closed low wattage solenoid using 24 volts, 50/60 cycle solenoid power requirement. Solenoid shall be epoxy encased. A union shall be installed on the discharge end.

C. Remote control valves shall be wired to controller in same numerical sequence as indicated on drawings

 D. Remote control valves shall be as indicated on the drawings. 2.13 MASTER CONTROL VALVES

A. Flow sensor shall be compatible with the irrigation controller.

C. Hydrometer shall be compatible with the irrigation controller.

C. Quick coupler valves shall be as indicated on the drawings.

E. All sprinkler heads shall be as indicated on the drawings.

E. Master Control Valve shall be compatible with the irrigation controller.

F. Master control valves shall be as indicated on the drawings. 2.14 FLOW SENSOR

B. Flow sensor shall be as indicated on the drawings. 2.15 HYDROMETER

D. Hydrometer shall be as indicated on the drawings.

2.16 QUICK COUPLER VALVES A. Quick coupler valves shall be a one or two piece, heavy-duty brass construction with a working pressure of 150 PSI with a built in flow control and a self\_closing

B. Quick coupler shall be equipped with locking red brass cap covered with durable yellow thermo-plastic rubber cover. Key size shall be compatible with quick

2.17 SPRINKLER HEADS D. All sprinkler heads shall have check valves installed.

F. Riser nipples for all sprinkler heads shall be the same size as the riser opening in the sprinkler body and fabricated as shown on the drawings. 2.18 AUTOMATIC CONTROLLER

A. Controller shall be housed in a sturdy, locking, weather\_resistant case, furnished for maximum exterior protection. B. Controller shall be equipped with evapo-transpiration (ET) sensor, which adjusts the controller programming based on local climatic conditions. The sensor shall also have a rain sensing shut-off switch, wind sensing shut off switch, and freeze sensing shut-off of switch.

1. If a moisture sensor is used in lieu of an evapo-transpiration sensor an additional sensor, which has a rain-sensing shut-off switch, wind sensing shut-off switch, and freeze sensing shut-off switch shall be provided. C. Automatic controller shall be as indicated on the drawings.

D. All decoders shall be per the controller manufacturer's specifications. E. Decoder model number shall be as shown on the drawings.

2.19 CONTROLLER DECODERS

A. Low voltage

2.20 ELECTRICAL CONTROL WIRING

1. The electrical control wire shall be direct burial type UF, no. 14 AWG, solid, single conductor, copper wire UL approved or larger, if required to operate system 2. For 2-Wire controllers all irrigation wire for the controller, flow sensor, master valve, hydrometer, remote control valves and moisture sensors shall be per the

3. Color code wires to each valve. Common wire shall be white. 4. If multiple controllers are being utilized, and wire paths of different controllers cross each other, both common and control wires from each controller to be of different colors.

5. Control wire splices: Splices are when required shall be placed in splice boxes. 6. Wire connections shall be per the controller manufacturer's specifications and recommendations B. High voltage

controller manufacturer's specifications and recommenda

 Shall be of type as required by local codes and ordinances. 2. Shall be of proper size to accommodate needs of equipment it is to serve.

2.21 VALVE BOXES AND MATERIALS A. Valve boxes: valve boxes shall be constructed of ABS (acrylonitrile butadiene styrene) plastic, green in color, with rigid base and sides and shall be supplied with bolt lock cover secured with stainless steel bolts. Cover shall be identified as shown on drawings. Provide box extensions as require

1. Master valves, flow sensors, remote control irrigation valves, gate valves, and ball valves 3 inch or less in size shall use a 14 inch x 19 inch x 12 inch

2. Quick coupler valves, wire splices, and grounding rods shall use a 10 inch circular box.

2.22 CONCRETE THRUST BLOCKS A. Concrete thrust blocks shall be sized per the pipe manufactures requirement or as indicated on the drawings.

2.23 VALVE IDENTIFICATION TAGS A. Valve Identification Tags shall be 2.25 inch x 2.65 inch polyurethane. Color: potable water; yellow / Non-potable water; purple. Tags shall be permanently attached to each remote control valve with tamper proof seals as indicated on the drawings.

2.24 EQUIPMENT TO BE FURNISHED TO OWNER

A. Two (2) sets of keys for each automatic controller. B. Two (2) 48 inch tee wrenches for operating the gate valves.

C. Three (3) sets of special tools required for removing, disassembling and adjusting each type of sprinkler and valve supplied on this project.

A. Furnish all materials and equipment not specified above, but which are necessary for completion of the work as intended.

D. Five (5) Extra sprinkler heads, nozzles, shrub adapters, nozzle filter screens, for each type used on the project. E. Two (2) quick coupler keys to match manufacturer type of quick coupler.

B. Sand shall be masonry sand ASTM C 144 or coarse concrete sand, ASTM C 33.

2.25 INCIDENTAL MATERIALS AND EQUIPMENT

2.26 MAIN LINE LOCATOR TAPE A. 3 - inch wide plastic detectable locator tape

2.27 MAIN LINE AND LATERAL LINE BEDDING SAND A. Sand shall consist of natural or manufactured granular material, free of organic material, mica, loam, clay or other substances not suitable for the intended

Revision/Issue Date

Project Name and Address COLUMBUS ST. |EL GRANADA, CA

Drawn By 4BInc. 236-2019 Checked By Approved By



General Notes

Firm Name and Address LIC # 1012730 IA CERT # 57436

### PART 3 EXECUTION

### 3.1 GENERAL REQUIREMENTS

- A. Code requirements shall be those of state and municipal codes and regulations locally governing this work, providing that any requirements of the drawings and specifications, not conflicting therewith, but exceeding the code requirements, shall govern unless written permission to the contrary is granted by the Owner's Representative.
- B. Extreme care shall be exercised at all times by the Contractor in excavating and working in the project area due to existing utilities and irrigation systems to remain. Contractor shall be fully responsible for expenses incurred in the repair of damages caused by their operation
- 1. The Contractor is responsible for identifying and maintaining existing irrigation main lines that supply water to areas on the site as noted on the drawings and outside of the proposed limit of work. The Contractor shall relocate or replace existing irrigation main line piping as required to provide a continuous supply of water to all areas of existing irrigation on
- a. Providing continuous water supply shall include hand watering and or the use of watering trucks to provide adequate
- C. Plan locations of backflow preventers, valves, controllers, irrigation lines, sleeves, spray heads and other equipment are diagrammatic and indicate the spacing and relative locations of all installations. Final site conditions and existing and

proposed plantings shall determine final locations and adjusted as necessary and as directed to meet existing and proposed

- conditions and obtain complete water coverage. Minor changes in locations of the above from locations shown shall be made as necessary to avoid existing and proposed trees, piping, utilities, structures, etc. at the Contractor's expense or when directed by the Owner's Representative.
- 1. The Contractor shall be held responsible for relocation of any items without first obtaining the Owner's Representative's approval. The Contractor shall remove and relocate such items at their expense if so directed by the Owner's
- D. Prior to any work the Contractor shall stake out locations of all pipe, valves, equipment and irrigation heads and emitters using an approved staking method and maintain the staking of the approved layout in accordance with the drawings and any required modifications. Verify all horizontal and vertical site dimensions prior to staking of heads. Do not exceed spacing shown on drawings for any given area. If such modified spacing demand additional or less material than shown on the drawings, notify the Owner's Representative before beginning any work in the adjacent area.
- E. Stub out main line at all end runs and as shown on drawings. Stub out wires for future connection where indicated on plan
- F. Point of connection shall be approximately as shown on drawings. Connect new underground piping and valves and provide all flanges, adapters or other necessary fittings for connection.
- G. Permission to shut off any existing in-use water line must be obtained 48 hours in advance, in writing from the Owner. The Contractor shall receive instructions from the Owner's Representative as to the exact length of time of each shut-off.
- H. No fittings shall be installed on pipe underneath pavement or walls. I. Prior to starting any work, Contractor shall obtain a reading of existing static water pressure (no flow condition) at the designated point of connection and immediately submit written verification of pressure with date and time of recording to
- Owner's Representative. 3.2 TRENCHING, DIRECTIONAL BORING AND SLEEVING
- this section, including shoring of earth banks to prevent cave\_ins. B. The Contractor may directional bore lines where it is practical or where required on the plans.
- 1. Extend the bore 1' past the edge of pavement unless noted differently on the plans
- 2. Cap ends of each bore and locate ends at finished grade using metal stakes.
- 3. All boring and sleeving shall have detectable locator tape placed at the ends of the pipe.
- C. Make trenches for mains, laterals and control wiring straight and true to grade and free of protruding stones, roots or other

A. Perform all trenching, directional boring, sleeving and excavations as required for the installation of the work included under

- material that would prevent proper bedding of pipe or wire.
- D. Excavate trenches wide enough to allow a minimum of 4 inch between parallel pipelines and 8 inch from lines of other trades. Maintain 3 - inch vertical clearance between irrigation lines. Minimum transverse angle is 45 degrees. All pipes shall be able to be serviced or replaced without disturbing the other pipes.
- E. Trenches for pipelines shall be made of sufficient depth to provide the minimum cover from finished grade as follows:
- 4. Pressure main line: 18 inches below finish grade and 24-30 inches below paved areas in Schedule 40 PVC sleeves. 5. Reclaimed water constant pressure main lines shall cross at least twelve (12) inches below potable water lines.
- a. If a constant pressure reclaimed water main line must be installed above a potable water line or less than twelve (12) inches below a potable water line, then reclaimed water line shall be installed within an approved protective sleeve. The sleeve shall extend ten (10) feet from each side of the center of the potable line, for a total of twenty (20) feet. The sleeve shall be color-coded (purple) for use with reclaimed water.
- 3. Lateral lines: 12 inches below finish grade and 18 inches below paved areas in Schedule 40 PVC sleeves.
- 4. Control wiring: to the side of pressure main line and 24 inches below paved areas in Schedule 40 PVC sleeves.
- F. On new on-site systems (post-meter), the required horizontal separation between potable water lines, reclaimed water constant pressure main lines and sewer lines shall be a minimum of four (4) feet apart as directed by the project engineer and/ or regulatory agency. Measurements shall be between facing surfaces, not pipe centerlines. G. When trenching through areas of imported or modified soil, deposit imported or modified soils on one side of trench and
- subsoil on opposite side.

### 3.3 PIPE INSTALLATION

- A. General Pipe Installation
- 1. Exercise caution in handling, loading and storing, of plastic pipe and fittings to avoid damage. a. The pipe and fittings shall be stored under cover until using, and shall be transported in a vehicle with a bed long enough to allow the length of pipe to lay flat so as not to be subjected to undue bending or concentrated external load
- at any point. b. All pipe that has been dented or damaged shall be discarded unless such dent or damaged section is cut out and pipe
- reigined with a coupling. 2. Trench depth shall be as specified above from the finish grade to the top of the pipe.
- 3. Install a detectable pipe locator tape 6 to 8 inches above all main line pipes.

### B. Polyvinyl Chloride Pipe (PVC) Installation

- 1. Under no circumstance is pipe to rest on concrete, rock, wood blocks, construction debris or similar items.
- 2. No water shall be permitted in the pipe until a period of at least 24 hours has elapsed for solvent weld setting and curing.
- 3. Install assemblies and pipe to conform to respective details and where shown diagrammatically on drawings, using first class workmanship and best standard practices as approved. All fittings that are necessary for proper connections such as swing joints, offsets, and reducing bushings that are not shown on details shall be installed as necessary and directed
- 4. Dielectric bushings shall be used in any connections of dissimilar metals.
- 5. Gasketed plastic pipe: pipe-to-pipe joints or pipe to fittings shall be made in accordance with manufacturer's specifications.

### Solvent weld or threaded plastic pipe:

- a. Installation of all pipe and fittings shall be in strict accordance with manufacturer's specifications.
- b. Pipe shall be cut using approved PVC pipe cutters only. Sawed joints are disallowed. All field cuts shall be beveled to remove burrs and excess before gluing c. Welded joints shall be given a minimum of 15 minutes to set before moving or handling. Excess solvent on the
- exterior of the joint shall be wiped clean immediately after assembly. d. Plastic to metal connections shall be made with plastic adapters and if necessary, short (not close) brass
- threaded\_nipples. Connection shall be made with two (2) wraps of Teflon tape and hand tightened plus one turn with a strap wrench.
- e. Snake pipe horizontally in trench to allow one (1) foot of expansion and contraction per 100 feet of straight run.
- f. Threaded pipe joints shall be made using Teflon tape. Solvent shall not be used with threaded joints. Pipe shall be protected from tool damage during assembly. All damaged pipe shall be removed and replaced. Take up threaded joints with light wrench pressure.
- g. No close nipples or risers are allowed. Cross connections in piping is disallowed
- h. Center load pipe at 10 feet on center intervals with small amount of backfill to prevent arching and slipping under pressure. Other than this preliminary backfill all pipe joints, fittings and connections are to remain uncovered until successful completion of hydrostatic testing and written approval of the testing report.
- i. Concrete thrust blocks shall be constructed behind all pipe fittings 1-1/2 inch diameter and larger at all changes of direction of 45 degrees or more.

### C. Galvanized Pipe Installation

- 1. All joints shall be threaded with pipe joint compound used on all threads.
- 2. Dielectric bushings shall be used in any connections of dissimilar metals.

### 3.4 TRENCHING, DIRECTIONAL BORING, AND SLEEVING REVIEW:

A. Upon completion and installation of all trenching, directional boring, and sleeving, all installed irrigation control wiring, lines and fittings shall be visually observed by the Owner's Representative unless otherwise authorized. Do not cover any wires, lines or fittings until they have been tested and observed by the Owner's Representative.

### 3.5 FLUSHING

- A. Openings in piping system during installation are to be capped or plugged to prevent dirt and debris from entering pipe and equipment. Remove plugs when necessary to flush or complete system
- B. After completion and prior to the installation of any terminal fittings, the entire pipeline system shall be thoroughly flushed to remove dirt, debris or other material.

### 3.6 HYDROSTATIC PRESSURE TESTING

### A. After flushing, and the installation of valves the following tests shall be conducted in the sequence listed below. The Contractor shall furnish all equipment; materials and labor necessary to perform the tests and all tests shall be conducted in the presence of the Owner's Representative

- B. Water pressure tests shall be performed on all pressure main lines before any couplings, fittings, valves and the like are
- C. Immediately prior to testing, all irrigation lines shall be purged of all entrapped air or debris by adjusting control valves and installing temporary caps forcing water and debris to be discharged from a single outlet.
- D. Test all pressure main line at 150 PSI. For a minimum of four (4) hours with an allowable loss of 5 PSI. Pressure and gauges shall be read in PSI, and calibrated such that accurate determination of potential pressure loss can be ascertained.
- E. Re test as required until the system meets the requirements. Any leaks, which occur during test period, will be repaired immediately following the test. All pipe shall be re\_tested until final written acceptance.
- F. The Contractor is responsible for proving documentation stating the weather conditions, date, the start time and initial water
- pressure readings, the finish time and final water pressure readings and the type of equipment used to perform the test. The documentation must be signed by a witness acceptable to the Owner, verifying all of the above-mentioned conditions. G. Submit a written report of the pressure testing results with the other above required information to the Owner's

### BACKFLOW PREVENTER TESTING

Representative for approval.

- A. The backflow preventer shall be tested according to procedures and results per the requirements of the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California or American Water Works Association whichever is more stringent.
- B. Testing shall be performed by a Backflow Prevention Assembly Tester with a current certification from the American **Backflow Preventer Association**
- 3.8 CONTROLLER AND BOOSTER PUMP TESTING AND CERTIFICATION

A. Controller and booster Pump shall be certified by a factory approved certified professional. Contact xxxxxxxx at xxx.xxx.xxx. 3.9 BACKFILLING AND COMPACTING

- A. Irrigation trenches shall be carefully backfilled with material approved for backfilling and free of rocks and debris one (1) inch in diameter and larger. When back filling trenches in areas of imported or modified planting soil, replace any excavated
- subsoil at the bottom and the imported soil or modified planting soil at the top of the trench. B. Backfill shall be compacted with approved equipment to the following densities
- 1. Backfill under pavement and within 2 feet of the edge of pavement: Compact to 95% or greater of maximum dry density
- 2. Backfill of subsoil under imported planting mixes or modified existing planting soil: Between 85 and 90% of maximum dry
- 3. Backfill of imported planting mixes or modified existing planting soil: Compact to the requirements of the adjacent planting
- mix or planting soil as specified in section "Planting Soil". C. Finish grade of all trenches shall conform to adjacent grades without dips or other irregularities. Dispose of excess soil or
- debris off site at Contractor's expense. D. Any settling of backfill material during the maintenance or warranty period shall be repaired at the Contractor's expense, including any replacement or repair of soil, lawn, and plant material or paving surface.

### 3.10 RESURFACING PAVING OVER TRENCHES

- A. Restore all surfaces and repair existing underground installations damaged or cut as a result of the excavation to their original condition, satisfactory to the Owner's Representative.
- B. Trenches through paved areas shall be resurfaced with same materials quality and thickness as existing material. Paving restoration shall be performed by the project paving Sub-contractor or an approved Contractor skilled in paving work. C. The cost of all paving restoration work shall be the responsibility of the irrigation Contractor unless the trenching thru the

### 3.11 INSTALLATION OF EQUIPMENT

### 1. All equipment shall be installed to meet all installation requirements of the product manufacturer. In the event that the manufactures requirements cannot be implemented due to particular condition at the site or with other parts of the design,

- 2. Install all equipment at the approximately at the location(s) and as designated and detailed on the drawings. Verify all locations with the Owner's Representative.
- 3. Install all valves within a valve box of sufficient size to accommodate the installation and servicing of the equipment. Group valves together where practical and locate in shrub planting areas.
- 4. All sprinkler irrigation systems that are using water from potable water systems shall require backflow prevention. All backflow prevention devices shall meet and be installed in accordance with requirements set forth by local codes and the health department

### B. Pressure regulator:

1. Set regulator for required PSI per manufacturer's specifications. C. Check Valve:

paving was, by previous agreement, part of the general project related construction.

obtain the Owner's Representative's written authorization and approval for any modifications.

### 1. Install check valves approximately at the locations necessary to prevent low head run off. D. Remote control valves:

- Install one remote control valve per valve box.
- 2. Remote control valve manifolds and quick coupler valves shall be separate allowing use of a quick coupler with all remote
- 3. Install boxes no farther than 12 inches from edge of paving and perpendicular to edge of paving and parallel to each other. Allow 12 inches clearance between adjacent valve boxes.

### E. Quick coupler valve:

- 1. Install each quick coupler valve in its own valve box.
- 2. Install thrust blocks on quick couplers.
- Place no closer than 12 inches to adjacent paving. 4. Install 18 inches off set from main line.

### F. Sprinkler heads:

- 1. All main lines and lateral lines, including risers, shall be flushed and pressure tested before installing sprinkler heads.
- 2. Install specified sprinkler heads as shown in details at locations shown on the drawings. Adjust layout for full coverage, spacing of heads shall not exceed the maximum spacing recommended by the manufacturer.
- 3. All sprinkler heads shall be set perpendicular to finish grade unless otherwise designated on the drawings or details.
- 1. Remote control valves shall be connected to controller in numerical sequence as shown on the drawings.
- 2. Controller shall be tested with complete electrical connections. The Contractor shall be responsible for temporary power to the controller for operation and testing purposes.
- 3. Connections to control wiring shall be made within the pedestal of the controller. All wire shall follow the pressure main insofar as possible 4. Electrical wiring shall be in a rigid gray PVC plastic conduit from controller to electrical outlet. The electrical Contractor
- shall be responsible for installing all wiring to the controller, in order to complete this installation. A disconnect switch shall be included. H. Wiring:

### Low Voltage

- a. Control wiring between controller and electrical valves shall be installed in the same trench as the main line where practical. The wire shall be bundled and secured to the lower quadrant of the trench at 10 foot intervals with plastic
- b. When the control wiring cannot be installed in the same main line trench it shall be installed a minimum of 18 inches below finish grade and a bright colored plastic ribbon with suitable markings shall be installed in the trench 6 inches below grade directly over the wire.
- c. An expansion loop shall be provided every 500 feet in a box and inside each valve box. Expansion loop shall be formed by wrapping wire at least eight (8) times around a ¾ inch pipe and withdrawing pipe.
- d. Provide one control wire to service each valve in system.
- e. Provide 03 common wire(s) per controller, or as needed.
- f. Run two (2) spare #14 1 wires from controller along entire main line to last electric remote control valve on each and every leg of main line. Label spare wires at controller and wire stub to be located in a box.
- g. All control wire splices not occurring at control valve shall be installed in a separate splice valve box.
- h. Wire markers (sealed, 1 inch to 3 inch square) are to identify control wires at valves and at terminal strips of controller.
- At the terminal strip mark each wire clearly indicting valve circuit number.
- a. All electrical work shall conform to local codes, ordinances and any authorities having jurisdiction. All high voltage electrical work to be performed by licensed electrician
- b. The Contractor shall provide 120-volt power connection to the automatic controller unless noted otherwise on drawings.

### Valve boxes: 1. Install one valve box for each type of valve installed as per the details.

2. Gravel sump shall be installed after compaction of all trenches. Final portion of gravel shall be placed inside valve box after valve is backfilled and compacted

### 3. Permanently label valve number and or controller letter on top of valve box lid using a method approved by the Owners

### Representative

### J. Tracer wire:

- 1. Tracer wire shall be installed with non\_metallic plastic irrigation main lines where controller wires are not buried in the
- 2. The tracer wire shall be placed on the bottom of the trench under the vertical projection of the pipe with spliced joints
- soldered and covered with insulation type tape.
- 3. Tracer wire shall be of a color not used for valve wiring. Terminate wire in a valve box. Provide enough length of wire to make a loop and attach wire marker with the designation "tracer wire".

### K. Drip Installation: 1. Clamp fittings with Oetiker clamps or approved equal when operating pressure exceeds specific drip tubing fitting

- 2. When installing drip tubing, install soil staples as listed below:
- a. Sandy Soil One staple every three (3') feet and two (2) staples on each change of direction (tee, elbow, or cross).
- b. Loam Soil One staple every four (4') feet and two (2) staples on each change of direction (tee, elbow, or cross). c. Clay Soil - One staple every five (5') feet and two (2) staples on each change of direction (tee, elbow, or cross).
- 3. Cap or plug all openings as soon as lines have been installed to prevent the intrusion of materials that would obstruct the
- pipe. Leave in place until removal is necessary for completion of installation. 4. Thoroughly flush all water lines before installing valves and other hydrants.

### 3.12 ADJUSTMENT AND COVERAGE TEST

- 1. The Contractor shall flush and adjust all sprinkler heads, valves and all other equipment to ascertain that they function according to the manufacturer's data.
- 2. Adjust all sprinkler heads not to overspray onto walks, roadways and buildings when under maximum operating pressure and during times of normal prevailing winds.

- 1. The Contractor shall perform the coverage test in the presence of the Owner's Representative after all sprinkler heads have been installed, flushed and adjusted. Each section is tested to demonstrate uniform and adequate coverage of the planting areas serviced.
- 2. Any systems that require adjustments for full and even coverage shall be done by the Contractor prior to final acceptance at the direction of the Owner's Representative at no additional cost. Adjustments may also include realignment of pipes,
- addition of extra heads, and changes in nozzle type or size. 3. The Contractor at no additional cost shall immediately correct all unauthorized changes or improper installation practices.
- 4. The entire irrigation system shall be operating properly with written approval of the installation by the Owner's representative prior to beginning any planting operations.

### 3.13 REPAIR OF PLANTING SOIL

### A. Any areas of planting soil including imported or existing soils or modified planting soil which become compacted or disturbed or degraded as a result of the installation of the irrigation system shall be restored to the specified quality and compaction prior to beginning planting operations at no additional expense to the Owner. Restoration methods and depth of compaction

- A. During installation, keep the site free of trash, pavements reasonably clean and work area in an orderly condition at the end of each day. Remove trash and debris in containers from the site no less than once a week.
  - a. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Contractor from all surfaces within the project or on public right of ways and neighboring property.

### B. Once installation is complete, wash all soil from pavements and other structures.

remediation shall be approved by the Owner's Representative.

1. Make all repairs to grades ruts, and damage to the work or other work at the site.

### 2. Remove and dispose of all excess soil, packaging, and other material brought to the site by the Contractor. 3.15 PROTECTION

Representative shall determine when such treatment, replacement or repair is satisfactory.

### A. The Contractor shall protect installed irrigation work from damage due to operations by other Contractors or trespassers. 1. Maintain protection during installation until Acceptance. Treat, repair or replace damaged work immediately. The Owner's

- 3.16 PRE-MAINTENANCE OBSERVATION: A. Once the entire system shall be completely installed and operational and all planting is installed, the Owner's Representative shall observe the system and prepare a written punch list indicating all items to be corrected and the beginning date of the
- B. The irrigation/landscape contractor is responsible for scheduling an irrigation audit prior to general maintenance taking effect. The irrigation auditor must be CLIA certified, in good standing and must comply with all Irrigation Associations methods and
- C. This is not final acceptance and does not relieve the Contractor from any of the responsibilities in the contract documents.
- 3.17 GENERAL MAINTENANCE AND THE MAINTENANCE PERIOD A. General maintenance shall begin immediately after installation of irrigation system. The general maintenance and the
  - maintenance period shall include the following: 1. On a weekly basis the Contractor shall keep the irrigation system in good running order and make observations on the entire system for proper operation and coverage. Repair and cleaning shall be done to keep the system in full operation.
  - 2. Records of all timing changes to control valves from initial installation to time of final acceptance shall be kept and turned over to the Owner's Representative at the time of final acceptance. 3. During the last week of the maintenance period, provide equipment familiarization and instruction on the total operations
- of the system to the personnel who will assume responsibility for running the irrigation system. 4. At the end of the maintenance period, turn over all operations logs, manuals, instructions, schedules, keys and any other equipment necessary for operation of the irrigation system to the Owner's Representative who will assume responsibility
- for the operations and maintenance of the irrigation system. B. The maintenance period for the irrigation system shall coincide with the maintenance period for the Planting. (See

### specification section "Planting" 3.18 SUBSTANTIAL COMPLETION ACCEPTANCE

work is substantially complete

maintenance period will be extended

- A. Upon written notice from the Contractor, the Owners Representative shall review the work and make a determination if the
- B. The date of substantial completion of the irrigation shall be the date when the Owner's Representative accepts that all work in Planting, Planting Soil, and Irrigation installation sections is complete.
- 3.19 FINAL ACCEPTANCE / SYSTEM MALFUNCTION CORRECTIONS A. At the end of the Plant Warrantee and Maintenance period, (See specification section "Planting") the Owner's Representative
- shall inspect the irrigation work and establish that all provisions of the irrigation system are complete and the system is
- 1. Restore any soil settlement over trenches and other parts of the irrigation system. 2. Replace, repair or reset any malfunctioning parts of the irrigation system.

B. The Contractor shall show all corrections made from punch list. Any items deemed not acceptable shall be reworked and the

D. Failure to pass review: If the work fails to pass final review, any subsequent observations must be rescheduled as per above.

C. The Contractor shall show evidence that the Owner's Representative has received all charts, records, drawings, and extra equipment as required before final acceptance

### The cost to the Owner for additional observations will be charged to the Contractor at the prevailing hourly rate of the END OF SECTION 32 8400

# **M**

General Notes

Revision/Issue Date

**Project Name and Address** COLUMBUS ST. |EL GRANADA, CA

Drawn By 236-2019 4BInc. Checked By Approved By



Firm Name and Address

LIC # 1012730 IA CERT # 57436

### Irrigation/Watering Responsibility

O It is the responsibility of the Maintenance Contractor to operate the irrigation system in an efficient manner and to minimize water waste. It is the Maintenance Contractor's responsibility to adjust the system to apply water in accordance with plant requirements based on weather, soil, and site conditions. The irrigation program shall be scheduled to minimize water waste through runoff, excessive irrigation run times, utilize CYCLE SOAK scheduling when applicable. It is the responsibility of the Maintenance Contractor to operate the irrigation system based on local municipal guidelines.

### Irrigation Activation

- O Activate irrigation system in spring (or when weather permits). Charge mainline in February or March to check for leaks and/or malfunctioning
- O Turn on backflow preventers, open gate valves and activate booster pumps if installed.
- Set the irrigation controller to RUN MODE and verify that all programs are activated and set up to be run in Self Adjusted mode.
- O Site verification and adjustments. This includes turning on each zone, monitoring for leaks or malfunctioning parts, cutting grass away from sprinkler heads and adjusting sprinklers for proper arc and maximum
- Verify that drip irrigation is functional and that distribution tubing has not been cut or broken during non operational period.
- O Service, clean and adjust and weather sensor system. This is critical for ALL self adjusting controllers.
- o If applicable service irrigation booster pump, this need to be completed by the manufacturers certified technician.

### Irrigation Monitoring/Landscape Watering

- Check the ET/Weather Based self adjusting system programming, Flow Sensor and Master Valve operation and programming; adjust as required to ensure proper operation.
- ALL Backflow Prevention Devices are to be maintained as per Local city
- or county codes. O All turf areas shall be monitored to determine the need for
- supplemental irrigation. Frequency and duration of each watering will be dependent on local weather conditions. To determine the need for watering, Landscape Maintenance Contractor shall use a soil probe to examine the first 6-12" of the soil profile. If the soil is cool, damp and holds its shape, watering is not necessary. Plant material roots should be encourage to root as deep as possible, this is accomplished by deep root watering, longer irrigation run times and utilizing CYLCE SOAK method. Frequent shallow irrigation scheduling is ineffective and will only promote shallow rooting and require excessive water waste.

- Groundcover and shrub beds shall be watered using an automatic irrigation system. The entire groundcover/shrub bed shall be soaked to a depth to maximize healthy plant root growth. Irrigation run time to be based on irrigation device precipitation rate (not flow rate) and plant material irrigation demand. (Use WUCOLS reference for plant watering needs). In the event of establishing plants, or compromised soil profile, watering frequencies may be adjusted.
- O Establish time settings and intervals of irrigation water application for each valve of all irrigation zones. Make adjustments when necessary to correspond to variable watering requirements. Check for coverage and plugged emission/nozzle devices. Clean devices and adjust devices while maintaining the system in proper working order.
- ALL automatic controllers will be programmed to apply water during hours as permitted by local town, city or county ordinances.

### Irrigation System Repair

- O Cleaning and adjusting the sprinklers heads are the Maintenance Contractor's responsibility. Repair and/or replacement of any vandalized or malfunctioning component beyond Maintenance Contractor's control is the responsibility of the Owner/Agent. Any damage caused by Maintenance Contractor will be repaired by Maintenance Contractor at no cost to the Owner/Agent.
- All irrigation repaired or replaced MUST be in accordance with the original irrigation design, local city or county guidelines and must provide the maximum efficiency as possible so as NOT to waste water.
- O ALL Drip systems are to be manually flushed a minimum one time per year and filters to be cleaned on a regular basis.
- All damaged and repaired pipe MUST be flushed of all debris. Maintenance Contractor to guarantee full operational and efficient
- performance of repaired systems. O Repairs to Backflow Prevention Devices must be conducted by a trained certified backflow technician.
- O It is recommended that ALL irrigation maintenance and repair be performed by California Licensed and/or Certified contractor. Not maintaining irrigation systems in an efficient manner will result in plant and landscape degradation and additional maintenance costs.

### Irrigation System Winterization

• Where applicable, shut off and drain irrigation system(s) at the end of the irrigation season. Turn off all main supply valves, open all manual drain valves, and bleed valves on backflow prevention devices. Perform winterization prior to November 1st.

### Irrigation Start up

needed.

Flush all drip lines at flush points.

0.13

YES

 Remove and clean all filters and replace any damaged filters O Check that all weathers sensors are functioning and replace batteries as

0.9 | 0.015 | 24X24 | 100 |

### DEVICES / 1" GPM FLOW GPM GPH 0.5 1700 0.02 850 14.2 0.08 15.0 120 7 0.12 100 11.7 240 10 0.17 15.0 360 12 0.2 15.0 480 18 0.3 15.0 14.8 600 0.4 30 30 0.5 15.0

15

15.0

**EMITTER COUNT FOR 1" VALVE** 

60

	1				
				1" VALVE BA	SED ON 15 GPM MAX
RIP LIN	E CHART				
GPH	GPM	SPACING	SQUARE FOOTAGE	FLOW GPM	PRECIP RATE
0.27	0.0045	12x12	100	0.44	0.42
0.27	0.0045	12x18	100	0.29	0.28
0.27	0.0045	12x24	100	0.22	0.21
0.27	0.0045	18x18	100	0.19	0.19
0.27	0.0045	18x24	100	0.13	0.14
0.27	0.0045	24x24	100	0.11	0.1
0.4	0.066	12x12	100	0.65	0.64
0.4	0.066	12x18	100	0.43	0.43
0.4	0.066	12x24	100	0.33	0.32
0.4	0.066	18x18	100	0.29	0.29
0.4	0.066	18x24	100	0.20	0.21
0.4	0.066	24x24	100	0.16	0.16
0.6	0.01	12X12	100	0.99	0.96
0.6	0.01	12X18	100	0.66	0.64
0.6	0.01	12X24	100	0.50	0.48
0.6	0.01	18X18	100	0.44	0.43
0.6	0.01	18X24	100	0.33	0.32
0.6	0.01	24x24	100	0.25	0.24
0.9	0.015	12X12	100	1.48	1.44
0.9	0.015	12X18	100	0.99	0.96
0.9	0.015	12X24	100	0.75	0.72
0.9	0.015	18X18	100	0.66	0.64
0.9	0.015	18X24	100	0.50	0.48
				l	

INLINE FORMULA	
	NLINE FORMULA
PR= 231.1 x Emitter Flow /Emitter Spacing x Row Spacing	PR= 231.1 x Emitter Flow /Emitter Spacing x Row Spacing

### DRIP PRECIPITATION RATES

GPH	GPM	Wr	~	# Devices	WA	Precip	
деп	GPIVI	VVI	Cr	# Devices	WA	Rate	
1	0.017	1	1	1	3.1	0.51	
2	0.033	1.5	1	1	7.1	0.45	
5	0.083	2	1	1	12.6	0.64	
7	0.117	2.5	1	1	19.6	0.57	
10	0.167	3	1	1	28.3	0.57	
12	0.2	3.5	1	1	38.5	0.50	
18	0.3	4	1	1	50.2	0.58	
24	0.4	4.5	1	1	63.6	0.61	
30	0.5	5	1	1	78.5	0.61	
60	1	7	1	1	153.9	0.63	ĺ

### WETTED AREA OF SOIL TYPES

WETTED AREA O	F SOIL TYP	LEGEND					
SOIL TYPE	Cr (FT)	SOIL TYPE	Cr (FT)				
CLAY	1.0	LOAM	0.7	Cr	Soil Coefficient		
CLAY LOAM	1.0	LOAMY SAND	0.4	TWr	Total Wetted Area		
COURSE SAND	0.2	SANDY LOAM	0.6	WA	Wetted Area		
FINE SAND	0.3	SILT LOAM	0.9				

### BASIC INTAKE RATE

SOIL TYPE	BASIC INFILTRATION RATE
ANDY	Less than 1.5"/hr
ANDY LOAM	.75 - 1.25"/hr
DAM	.75"/hr
LAY LOAM	.40"/hr
LAY	.20"/hr

### TREE RINGS 12" O.C EMITTER SPACING. MIN 3 RINGS PER TREE

RADIUS	CIRCUMF	TOTAL LF	FLOW RATE	TOTAL FLOW	PRECIP RATE	TOTAL FLOW/RING COUNT
18"	3.14*DIA	9.42	0.6 GPH	5 GPH	0.96"/HR	3 RINGS@ .6 GPH = 29 GPH
30"	3.14*DIA	15.7	0.6 GPH	9 GPH	0.96"/HR	4 RINGS@ .6 GPH = 47 GPH
48"	3.14*DIA	25.12	0.6 GPH	15 GPH	0.96"/HR	
60"	3.14*DIA	31.4	0.6 GPH	18 GPH	0.96"/HR	
18"	3.14*DIA	9.42	0.9 GPH	7.5 GPH	1.44"/HR	3 RINGS@ .9 GPH = 42.5 GPH
30"	3.14*DIA	15.7	0.9 GPH	13 GPH	1.44"/HR	4 RINGS@ .9 GPH = 69.5 GPH
48"	3.14*DIA	25.12	0.9 GPH	22 GPH	1.44"/HR	
60"	3.14*DIA	31.4	0.9 GPH	27 GPH	1.44"/HR	

Formula B 1.605 x GPH / Wetted Area *Cr	Formula A	96.25 x GPH / 60 /Wetted Area*Cr
	Formula B	1.605 x GPH / Wetted Area *Cr

### IRRIGATION MAINTENANCE

### Job Name: Columbus St. Res

All Landscape Areas Total ETAF x Area

> HYDROZONE HIGH WATER USE

MODERATE WATER US

LOW WATER USE

VERY LOW WATER US

Total Area

verage ETAF

1 3	Reference Evapotranspira	ntion (ET <sub>0</sub> )	33.7		0.55					
	Rain Fall (Inches)			Usable	Rain Fall (Inches)	0				
	Hydrozone #/Planting Description <sup>a</sup>			Irrigation Efficiency (IE) <sup>©</sup>	ETAF (PE/IE)	Landscape Area (Sq. Ft.)	ETAF x Area	Estimated Total Water Use (ETWU) <sup>d</sup>	Gallons Per Minute GPM	% Landscape Area
Zone#	Regular Landscape A	Areas			0					
1	GRD.CVR-LOW	0.2	Drip	0.81	0.25	737	182	3802	3.22	20.15%
2	TREES- LOW	0.2	Drip	0.81	0.25	185	46	966	4.00	5.06%
3	SHRUBS-LOW	0.2	Drip	0.81	0.25	86	22	449	0.90	2,35%
4	GRD.CVR-LOW	0.2	Drip	0.81	0.25	1,222	302	6304	4.78	33.42%
5	GRD.CVR-LOW	0.2	Drip	0.81	0.25	1,262	312	6511	4.94	34.51%
6	TREES- LOW	0.5	Drip	0.81	0.62	145	90	1870	3.00	3.96%
7	SHRUBS- LOW	0,2	Drip	0.81	0.25	20	5	1 03	1.00	0.55%
	,				Totals	3657	255	5321	9.12	28.11%
	Special Landscape A	reas								
		Totals 0 0 0								
	ETWU Total 5321									
	Maxim um Allowed Water Allowance (MAWA) <sup>e</sup> 42 025									
	ETAF Calculations Regular Landscape Ar		1)		TAF for Regular t be 0.55 or belo			J ACRE FEET		0.016329
	Total ETAF x Area	958		Areas must be 0.55 or below for			IN/AW/	A ACRE FEET		0.128970

non-residential areas.

AREA SQ FEET

3,657

SUMMARY HYDROZONE

### a Hydrozone # / Planting Description e.g. 1.) Front lawn

3.) Medium water use planting b Irrigation Method 1.) Overhead Spray 2.) Drip

2.) Low water use planting

- E Irrigation Efficiency 1.) 0.75 for Overhead Spray 2.) 0.81 for Drip
- d ETWU (Annual Gallons Required) = Eto x 0.62 x ETAF x Area Where 0.62 is a conversion factor to change acre-inches per acre per year to gallons per square foot per year
- <sup>e</sup> MAWA (Annual Gallons Allowed) = (Eto-EPPT)X (0.62) [ (ETAF x LA) + ((1-ETAF) x SLA)] Where 0.62 is a conversion factor to change acre-inches per acre per year to gallons per square foot per year, LA is the total regular landscape area in square feet, SLA is the total special landscape area in square feet, and ETAF is 0.55 for residential areas and 0.45 for non-residential areas

### 0.81 Drip 0.81 Bubblers 0.81 Micro Spray 0.75 Rotary Nozzle 0.75 Rotor

### **ESTABLISHED PLANT IRRIGATION SCHEDULE**

PRECIPITATION RATES & SOIL INTAKE RATES

CLIENT	<b>:</b>	Columbus St	t. Residence										July Eto:	4.30			Site Annu	ial Eto:		33.7
															_		Avg Plant Factor Et:			0.2
Contro	ller	Hunter Icore	e `						ET SOURCE	Solar Syno	`			Soil Type	SANDY LOAM	1	% Site Irri	igation Effic:		0.71
Zone #	Program	Plant Type	Plant Factor	ET Plant Factor	Plant Factor x Eto	Root Depth	Shade Factor	Density Factor	Irrigation Type	Inches Precip Rate	% Dist Unif	Irri Water Requirement Inches	Total Period Run Time	Valve Cycle Time	Cycles	Totals Days Per July	Zone GPM	Total GPM	Total Run Days/Yr	Total Gallons/Yr
1	Α	Groundcover	Low	0.2	0.9	6	1	1	Inline Drip	0.37	0.9	0.22	19	19	1	8	3.22	62	51	3,168.36
2	В	Tree	Low	0.2	0.9	6	1	1	Tree Rings	1	0.9	0.22	7	7	1	8	4	29	51	1,456.27
3	Α	Shrub	Low	0.2	0.9	6	1	1	Inline Drip	0.37	0.9	0.22	19	19	1	8	0.9	17	51	885.57
4	Α	Groundcover	Low	0.2	0.9	12	1	1	Inline Drip	0.37	0.9	0.22	19	19	1	8	4.78	93	51	4,703.35
5	Α	Groundcover	Low	0.2	0.9	12	1	1	Inline Drip	0.37	0.9	0.22	19	19	1	8	4.94	96	51	4,860.78
6	В	Tree	Low	0.2	0.9	12	1	1	Tree Rings	1	0.9	0.22	7	7	1	8	3	22	51	1,092.20
7	Α	Shrub	Low	0.2	0.9	18	1	1	Inline Drip	0.37	0.9	0.22	19	19	1	8	1	19	51	983.96
	Average Site % DU 0.90 65 Total Run Time																			

### 17,204.51 Estimated Total Water Use: Gallons

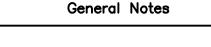
	IRRIGATION DAYS	5											
	JANUARY	FEBRUARY	MARCH	APIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL DAYS
Program A	1	2	4	5	7	8	8	7	5	3	2	1	51
Program B	1	2	4	5	7	8	8	7	5	3	2	1	51

Program	LANDSCAPE TYPE	CYCLES	CYCLE RUN		SOAK TIME	TOTAL SOAK TIME		Notes
Α	GROUNDCOVER DRIP	1	95	MINS			MINS	CONTRACTOR TO SET UP CYCLE SOAK ON ALL SCHEDULES
В	TREES	1	14	MINS			MINS	OR MULTIPLE START TIMES. THIS WILL ELIMINATE
С				MINS			MINS	PUDDLING OR RUN OFF. RUN MULTIPLE START TIME TO ACCOMPLISH WATER WINDOW RESTRICTIONS. IT OS THE
D				MINS				OPERATORS RESPONSIBILITY TO MANAGE THIS SITE SO AS
E				MINS			MINS	NOT TO EXCEED THE ESTIMATED. TOTAL WATER USE ETWU
E				MINS			MINS	
F				MINS			MINS	

NOTES: This irrigation schedule is set up as a base guide only, contractor must adjust irrigation controller so as to irrigate based on plants needs and not to exceed the ETWU usage. Set irrigation controller to maximise Cycle Soak through programming. We are not responsible for overseeing controller scheduling. RUN TIM E FORMULA = 60 X ET X Kc/PRXEA

60 = MINUTES ET = EVAPOTRANSPIRATION (DAILY) Kc PLANT COEFFICIENCY PR = PRECIPITATION RATE EA = APPLICATION EFFICIENCY

IRRIGATION SCHEDULE





## NOL NOL RRIG

No.	Revision/Issue	Date
		•

Know what's below.

Call before you dig.



Project Name and Address COLUMBUS ST. EL GRANADA, CA

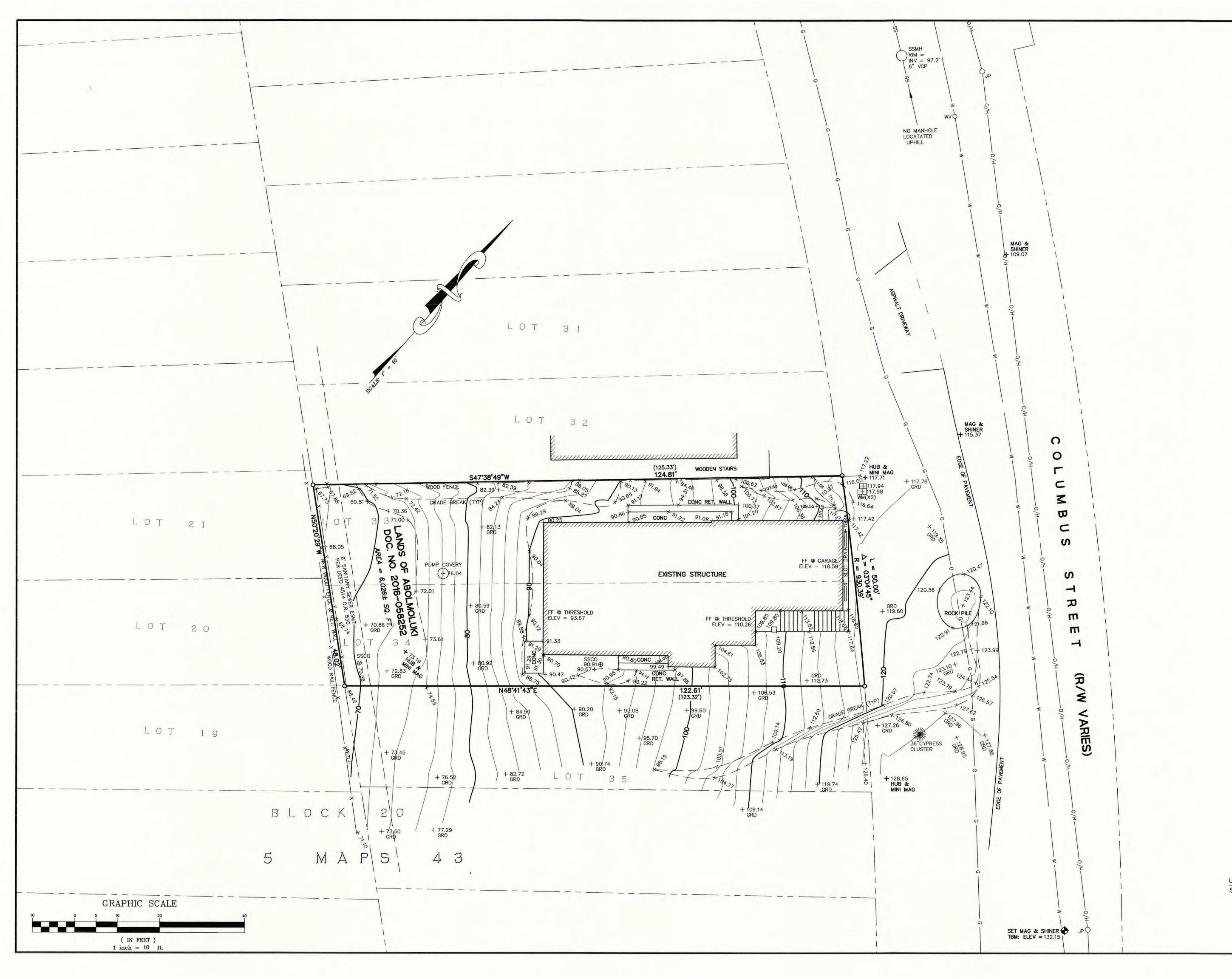
Drawn By 4BInc. 236-2019 Checked By Approved By

IR-5.0

**MWELO CALCULATIONS** 

% ETWU OF MAWA

PASS:



### **BOUNDARY NOTE:**

MONUMENTS HAVE BEEN SET AT THE PROPERTY CORNERS, AS SHOWN HEREON, AND A RECORD OF SURVEY HAS BEEN FILED WITH THE COUNTY OF SAN MATEO IN VOL. 43 OF LLS MAPS AT PAGE 73.

### BASIS OF ELEVATIONS:

ELEVATIONS ARE BASED UPON AN ASSUMED DATUM.

TBM: SET MAG NAIL AND SHINER ALONG COLUMBUS STREET, AS SHOWN. ELEVATION = 132.15'

### BASIS OF BEARINGS:

THE BEARING S43\*47'30"W BETWEEN TWO FOUND BRASS DISK MONUMENTS, AS SHOWN ON THAT CERTAIN RECORD OF SURVEY FILED IN VOLUME 8 OF L.L.S. MAPS AT PAGES 108—111, WAS USED AS THE BASIS OF BEARINGS FOR THIS SURVEY.

### LEGEND:

O SET 3/4" IP WITH PLASTIC PLUG "LS 7701" AND TACK PER 43 LLS 73

### UTILITY NOTE:

THE UTILITIES EXISTING ON THE SURFACE AND SHOWN ON THIS DRAWING HAVE BEEN LOCATED BY FIELD SURVEY. ALL UNDERGROUND UTILITIES SHOWN ON THIS DRAWING ARE FROM RECORDS OF THE VARIOUS UTILITY COMPANIES AND THE SURVEYOR DOES NOT ASSUME RESPONSIBILITY FOR THEIR COMPLETENESS, INDICATED LOCATION, OR SIZE. RECORD UTILITY LOCATION SHOULD BE CONFIRMED BY EXPOSING THE UTILITY.



### 12/23/19

### AS BUILT SURVEY

LANDS OF ABOLMOLUKI DOCUMENT # 2016-058252 O.R. LOTS 33 AND 34, BLOCK 20 "PLAT OF SUBDIVISION NO. 1 OF GRANADA" VOLUME 5 OF MAPS AT PAGE 43

### ASSESSOR'S PARCEL NUMBER: 047-275-050

(1120 COLUMBUS STREET, EL GRANADA)

UNINCORPORATED SAN MATEO COUNTY CALIFORNIA

SCALE: 1" = 10' DECEMBER, 2019

### B & H SURVEYING, INC.

PROFESSIONAL LAND SURVEYING
901 WALTERMIRE ST.
BELMONT, CA 94002
OFFICE (650) 637-1590