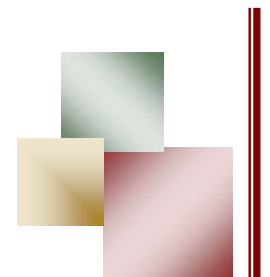


Engineering Department

Engineering Procedures Manual



September 2023

CITY OF BRENTWOOD ENGINEERING PROCEDURES MANUAL

Revision Date: September 2023

The City of Brentwood has established minimum standards for the design, preparation of plans, and construction of public as well as privately owned improvements within the City. These standards and requirements have been compiled in this Engineering Procedures Manual ("Manual").

In order to continue to ensure the construction of quality improvements, public safety and to satisfy changing industry standards, the City Engineer may from time to time issue amendments and clarifications to the Manual. It is the responsibility of all persons utilizing this Manual to obtain the most current copy. Interpretations of the materials contained herein may be obtained from the City Engineer or his representative.

Copies of this Manual may be obtained from our website at <http://www.brentwoodca.gov>. For questions please contact the City of Brentwood, Engineering Department, at (925) 516-5420.

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INTRODUCTION

The purpose of the Engineering Procedures Manual is to establish guidelines and standards for the design, preparation, submittal, and approval of plans for both public and private improvements within the City of Brentwood. This Manual is designed to assist all persons involved in the land development process as well as any party utilizing the public right-of-way for other than its intended use.

This Manual is intended to conform with and supplement the latest City of Brentwood Standard Plans and Specifications as well as other publications and standards that are referenced herein.

We hope that the preparation and publishing of this Manual is useful to all parties utilizing the public right-of-way or planning, design and constructing a development project in the City of Brentwood.



Allen Baquilar
Director of Engineering/City Engineer

DEFINITIONS

In this manual, the intent and meaning of the terms that are used shall be as defined:

APPLICANT - A person, resident, landowner, firm, agency, corporation, partnership, association or their representative, engaged in the land subdivision or development process or proposing to encroach within the public right-of-way

CATHODIC PROTECTION PLAN – An engineering plan prepared by a licensed corrosion engineer in the State of California, showing the design, applicable utility systems, appurtenant structures, facilities construction, including engineering and calculations.

CITY - Shall mean the City of Brentwood, a municipal corporation.

CITY ENGINEER - Shall mean the City Engineer of the City of Brentwood, Contra Costa County, California or his/her duly authorized representative.

CONSULTING ENGINEER - Any person or persons, firm, partnership, or corporation legally authorized to practice Civil Engineering in the State of California who prepares or submits improvement plans and specifications to the City Engineer of the City of Brentwood for approval.

COUNCIL - The City Council of the City of Brentwood.

DESIGN - Shall mean street alignment, grade, geometric section, structural section; sanitary sewer alignment, grade, size; water system alignment, valve sizing, fire hydrant location; storm drain alignment, grade, size; location and size of all required easements and rights-of-way; lands to be dedicated; lot size and configuration; grading; traffic access; and such other specific physical requirements in the plan and configuration of a development project or proposed encroachment into public right-of-way as may be necessary to ensure consistency with or implementation of, any applicable Standard Plans and Specifications, tentative Map, General or Specific Plan, or Conditions of Approval.

DEVELOPER - Shall mean any person, resident, landowner, firm, agency, corporation, partnership, association or their representative engaged in the development of property in part or in whole by the placing of any improvements thereon, whether the property was previously developed in whole, in part, or at all.

EASEMENT - Shall mean a right created by grant, reservation, agreement, prescription, or necessary implication, which the City, Public Utility or private entity has in the land of another, which shall be continuing and irrevocable unless formally abandoned.

ENCROACHMENT PERMIT – Permit required and issued for work with City right-of-way pursuant to City of Brentwood Municipal Code Chapter 12.08.

FINAL MAP - A map prepared in accordance with the provisions of local ordinance and the Subdivision Map Act which map is to be recorded in the office of the Recorder of Contra Costa County.

GRADING PERMIT – Permit required when performing grading operations pursuant to City of Brentwood Municipal Code Chapter 15.52 and City of Brentwood Ordinance 463 and 671.

GREEN INFRASTRUCTURE - the construction and retrofit of storm drainage to reduce runoff volumes, disperse runoff to vegetated areas, harvest and use runoff where feasible, promote infiltration and evapotranspiration, and use bioretention and other natural systems to detain and treat runoff before it reaches our creeks and Bay. Green infrastructure facilities include, but are not limited to, pervious pavement, infiltration basins, bioretention facilities or “raingardens”, green roofs, and rainwater harvesting systems.

IMPROVEMENT PLAN - An engineered plan, prepared by a licensed civil engineer in the State of California, showing the design, sanitary sewers, storm drain, water systems, grading and earthwork, roadways, and all other appurtenant structures, facilities and construction, including engineering calculations, comprising improvements required for a development project or work within the public right-of-way.

IMPROVEMENTS - Includes, but not limited to, street work, sidewalk, curb, gutter, driveways, water mains, sanitary sewer, storm drainage, public utilities, landscaping, fences, lighting, signing and pavement markings, green infrastructure and any and all other related improvements and facilities installed or proposed to be installed on land for both public and private use.

LOT LINE ADJUSTMENT – The changing of parcel lines, pursuant to Subdivision Map Act Section 66421(d), between four or fewer existing adjoining parcels without processing a subdivision map. A Lot Line Adjustment cannot create a greater number of parcels and must comply with local zoning and building ordinances.

MANUAL OF TRAFFIC CONTROL - Shall mean the “Manual of Uniform Traffic Control Devices (MUTCD)” issued by the State of California, Department of Transportation, latest edition, unless otherwise stated.

OFFSITE IMPROVEMENTS – all physical improvements, including but not limited to roads, sewer lines, water lines, stormwater systems and underground utility cables, constructed or placed outside of the project limits and for which improvements are to be used in common by the general public.

ONSITE IMPROVEMENTS – all physical improvements, including but not limited to roads, sewer lines, water lines, stormwater systems and underground utility cables, constructed or placed within a subdivision or development.

PARCEL MAP - A map prepared in accordance with the provisions of local ordinance and the Subdivision Map Act which map is designed to be recorded in the office of the Recorder of Contra Costa County. Parcel maps are used if property is being subdivided into 4 or fewer lots.

PARCEL MAP WAIVER- A division of property in which tentative parcel map and/or parcel map requirements are waived pursuant to the Subdivision Map Act and City of Brentwood Municipal Code Chapters 16.050 and 16.060.

PERMITTEE - Shall mean any person, firm, corporation or public agency which proposes to encroach upon a public right-of-way and has been issued a permit for such encroachment by the City Engineer.

RIGHT-OF-WAY – Means land or airspace which by deed, conveyance, agreement, easement dedication usage or process of law is reserved for and dedicated to the City or the general public for street, walkway, utility or other public purposes.

SECURITY – A monetary guarantee provided by applicant/permittee to ensure satisfactory completion of work and compliance with all local laws, standards and conditions.

SOILS REPORT - Shall mean a report prepared by any person or persons, firm, partnership, or corporation legally licensed to prepare “Soils Reports” in the State of California, and shall be current within 12 months.

STANDARD PLANS AND SPECIFICATIONS - Shall mean the Standard Plans and Specifications of the City of Brentwood, latest edition.

STATE HIGHWAY DESIGN MANUAL - Shall mean the State of California Department of Transportation Highway Design Manual, latest edition, unless otherwise stated.

STATE MATERIALS MANUAL - Shall mean the Materials Manual of Testing and Control Procedures of the State of California, Public Transportation Laboratory Manual of Test, Department of Transportation, latest edition, unless otherwise stated.

STATE PLANNING MANUAL - Shall mean the Planning Manual of Instructions of the State of California, Department of Public Works, Department of Transportation, Parts 1 - 8, latest edition, unless otherwise stated.

STATE SPECIFICATIONS - Shall mean the Standard Specifications for the State of California, Department of Transportation, latest edition, unless otherwise stated.

STATE STANDARD PLANS - Shall mean the Standard Plans of the State of California, Department of Transportation, latest edition, unless otherwise stated.

SUBDIVIDER - A person, resident or property owner, firm, corporation, partnership, association or their representative who proposes to divide, or causes to divide real property pursuant to the Subdivision Map Act for himself/herself or for others except that employees and consultants of such persons or entities, acting in such capacity, are not subdividers.

SUBDIVISION - The division, by any subdivider, of any unit or work of improved or unimproved land, or any portion thereof, shown on the latest equalized county assessment roll as a unit or contiguous units, for the purpose of sale, lease, or financing, whether immediate or future.

SUBDIVISION MAP ACT - Title 7, Division 2 of the State of California Government Code, as amended.

SUBDIVISION ORDINANCE - Shall mean Title 16 of the Brentwood Municipal Code (Subdivisions and Land Development Ordinance) as adopted and amended by the City Council of the City of Brentwood

TENTATIVE MAP - A map for the purpose of showing the design and improvement of a proposed subdivision and the existing conditions in and around it and need not be based upon an accurate or detailed final survey of the property.

TITLE REPORT – Shall mean a report showing the existing condition of title before a sale or loan transaction, which is current within 6 months.

TRANSPORTATION PERMIT – Permit required when moving any vehicle on City streets in excess height of 14, width of eight feet and /or length of 65 feet. Permit will be issued pursuant to City of Brentwood Municipal Code Chapter 10.16 and the California Vehicle Code.

VESTING TENTATIVE MAP - A tentative map refers to a map which meets the requirements of subdivision (a) and Section 66452 of Subdivision Map Act.

ZONING ORDINANCE - Shall mean Title 17 of the Brentwood Municipal Code (Zoning Ordinance) as adopted and amended by the City Council of the City of Brentwood.

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1. APPLICANT/PERMITTEE

The applicant is responsible to make certain that the following items are included with each application and submittal package that is submitted to the City Engineer for plan check. **Applications failing to include one or more of these items will not be accepted for processing.** All applications and submittals shall be submitted electronically. No submittals for plan check will be accepted by mail.

FIRST PLAN CHECK

A. FINAL MAPS (PARCEL MAPS OR TRACT MAPS)

The following items are required for the submittal and processing of Final Parcel and Tract Maps. Applications failing to include one or more of these items will not be accepted for processing.

1. One set electronically of the subject map.
2. One set electronically of closure calculations with a coordinate map indicating points referenced in the calculations.
3. One copy electronically of final project Conditions of Approval along with a signed Planning Commission Resolution.
4. One copy electronically of the current preliminary title report and subdivision guarantee. "Pro-forma" reports will not be accepted. **The title report shall not be more than six months old.**
5. One copy electronically copy of the approved Tentative Map.
6. One copy electronically of all reference documents utilized in the preparation of the map:
 - a. Abutting record maps, records-of-survey, etc.
 - b. All related easement documents.
 - c. Survey notes, tie notes and reference maps.
7. Completed application form and map check deposit.
8. Any additional information deemed reasonable and necessary by the City Engineer or required by local ordinance.

B. GRADING PLANS

The following items are required for submittal and processing of grading plans. **Applications failing to include one or more of these items will not be accepted for processing.** All grading plan submittals shall be signed and stamped by a Civil Engineer and a Soils/Geologic Engineer who are responsible for the preparation of the grading plans.

1. One copy electronically prepared by or under the direction of a Civil Engineer and a Soils/Geologic Engineer registered in the State of California with every plan sheet signed, with seal or stamp and expiration date.
2. One copy electronically of a project specific geological (soils) report prepared by a registered Soils/Geologic Engineer experienced in geotechnical engineering in this area and dated within 12 months. Soils report shall include shrinkage, subsidence, pH of the native soils, soil corrosivity to include: resistivity (in-situ & saturated), chlorides, sulfate and pH (taken at minimum depth of 2-5 feet) and pesticide levels.
3. One copy electronically completed Engineer's quantity and cost estimates (City of Brentwood form), including shrinkage and subsidence.
4. One copy electronically of the "Plan Check/Permit Submittal Application" completed in its entirety by the applicant. (City of Brentwood form; see AP-A).
5. One copy electronically of final project Conditions of Approval and signed Planning Commission Resolution.
6. Copies of any drainage or grading acceptance letters from adjacent property owners.
7. One set electronically of any other materials or information necessary for the plan check of the subject grading plan (improvement plans, adjacent grading plans, grading specifications, erosion control plans and specifications, earthwork calculations, dewatering plans, drainage and diversion structures, etc.).
8. A copy of the Storm Water Pollution Prevention Plan (SWPPP) including the WDID number for one acre and more for all projects as required by the City's NPDES Municipal Regional Permit or as otherwise required by the State Regional Water Quality Control Board.
9. A copy of mitigation measures related to grading operations.
10. Any additional information deemed reasonable and necessary by the City Engineer or required by local ordinance.

C. IMPROVEMENT PLANS

The following items are required for submittal and processing of improvement plans for both public and private development projects, in addition to work proposed within the City of Brentwood right-of-way. **Applications failing to include one or more of these items will not be accepted for processing.** All improvement plans shall be signed and stamped by the responsible Civil Engineer and shall have all other agency review signatures affixed prior to submittal for plan check.

1. One set electronically prepared by or under the direction of a Civil Engineer registered in the State of California, with every plan sheet signed, with seal or stamp and expiration date.

2. One set electronically of hydrology and hydraulic calculations (with hydrology maps). Calculations shall be in spreadsheet format, stamped & signed by design engineer. No handwritten calculations will be accepted.
3. One set electronically of Sanitary Sewer Hydraulic Calculations.
4. One set electronically of Water System Calculations.
5. One copy electronically of the "Plan Check/Permit Submittal Application" completed in its entirety by the applicant. (City of Brentwood form; see AP-A).
6. One copy electronically Engineer's quantity and cost estimates (City of Brentwood form; see AP-C).
7. One copy of the "Plan Check/Permit Submittal Application" completed in its entirety by the applicant. (City of Brentwood form; see AP-A).
8. One set electronically of final project Conditions of Approval and signed Planning Commission Resolution.
9. One set electronically of Joint Trench plans and copy of the "Letter of Intent" sent to the Utility Companies.
10. One set electronically of Cathodic Protection design calculations.
11. One complete set of any other applicable materials and information necessary for the plan check of the subject project improvement plans (approved Tentative or Final Map, grading plans, adjacent improvement plans, record or as-built drawing of existing facilities, current soils report, cross sections, special designs, structural calculations, lighting calculations, sight distance calculations, etc.).
12. One set electronically of Wall plans with and profiles with structural design calculations.
13. Copy of submitted "Notice of Intent" and Storm Water Pollution Plan, submitted to the Regional Water Quality Control Board, if applicable.
14. Copies of Mitigation Measures.
15. One copy electronically of Storm Water Quality Control Plan
16. Any additional information deemed reasonable and necessary by the City Engineer or required by local ordinance.

D. LOT LINE ADJUSTMENTS

1. GENERAL PROVISIONS

The Subdivision Map Act has provisions allowing minor adjustments of property lines for four or fewer existing adjoining parcels to be made without the necessity

of filing a parcel or tract map. In order for the applicant to utilize this procedure, however, the following criteria must be met:

- a. All of the property owners of the affected parcels must consent to the Lot Line Adjustment.
- b. The adjustment may not create a greater number of parcels than existed originally.
- c. The adjustment may not reduce the size of any parcel to less than minimum standards as set by the City of Brentwood's building and zoning ordinances.
- d. The resulting changes in ownership of the affected land must be conveyed by legal document if the subject property is not held under one ownership. The adjustment may be reflected by deed and/or by a Record of Survey prepared by a Licensed Land Surveyor or qualified Registered Civil Engineer if the subject property is held under a common ownership.

2. SUBMITTAL AND PROCESSING REQUIREMENTS (APPLICANT)

Prior to submittal of a Lot Line Adjustment, the applicant should contact the City's Engineering Department to verify that the adjustment will not violate any of the restrictions governing the use of this procedure. Additionally, the applicant should contact the City's Community Development Department to verify that the adjustment would comply with all building and zoning ordinances. The following items must be included in the original submittal package. **Applications failing to include one or more of these items will not be accepted for processing.**

- a. One application form fully completed with notarized signatures from all property owners affected.
- b. One Title Report on each affected parcel (current within 6 months) and any other reference material deemed necessary.
- c. One set electronically of legal descriptions for the original, transfer and resultant areas of all affected parcels prepared by a Licensed Land Surveyor or qualified Registered Civil Engineer.
- d. One set electronically of 8 ½" x 11" plat showing old and new lot lines and the transfer area hatch-marked, prepared by a Licensed Land Surveyor or qualified Registered Civil Engineer.
- e. Closure/Area calculations of original, transfer and resultant areas in order to verify new legal descriptions.
- f. Grant Deeds effecting property transfer.
- g. One copy of the "Plan Check/Permit Submittal Application" completed in its entirety by the applicant. (City of Brentwood form; see AP-A).
- h. Any other information deemed reasonable and necessary by the City Engineer.
- i. Proof from the Contra Costa County Tax Collector that current and prior years' property taxes for all affected parcels have been paid.

3. PROCESSING

- a. All submittals are to be made electronically to the Engineering Department.
- b. Engineering representative will review submittal package for required information and completeness.

- c. Engineering representative distributes for plan checking to the appropriate departments if the submittal package is in order and the fees have been paid.
- d. Following notification of approval, the applicant shall submit an original legal description and plat map “wet” stamped and signed by the appropriate Land Surveyor or Civil Engineer.
- e. Engineering representative will coordinate with the applicant’s title company to schedule recordation. The recorded document will be sent back to the City after recordation for filing and distribution.

4. CHECKLIST

a. PLAT FORMAT

The lot line adjustment plat shall be drawn, printed or otherwise reproduced in a manner guaranteeing a permanent record in black ink on a sheet size of 8 ½” x 11”.

b. PLAT REQUIREMENTS

The plat shall be drawn to 1” = 20’ scale unless otherwise specified by the City Engineer. It shall show the following applicable information as well as any other information necessary to adequately describe the adjusted lot line.

- i. Each lot in its entirety.
- ii. All bearings and distances, all curve data including the delta, radius length and radial bearing, if not perpendicular to tangent line.
- iii. Areas (net and gross acreage) of existing and proposed lots. Also provide the original and resultant areas for each proposed lot at the end of each legal description.
- iv. Lot numbers of the new lots
- v. Existing lot designations such as lot number and subdivision number for affected parcels and contiguous parcels.
- vi. Assessor’s parcel numbers.
- vii. All existing and proposed easements.
- viii. Tie to basis of bearings. Basis of Bearings shall be based on the California Coordinate System (NAD 83), 1990 Adjustment or current adjustment as directed by the City Engineer, as established by the use of two found monuments as shown on record of survey no. 2498 (118 LSM 40).
- ix. Abutting streets and alleys showing names, centerlines, widths and monuments (with LS No. and recording map information).
- x. Old lot line shall be shown as lightly dashed and new lot line shall be shown as a solid line with dimensioning between them. Hatch-mark the transfer area and label as such.
- xi. Vicinity map at a scale of approximately 1” = 200’.
- xii. North arrow and scale.
- xiii. Show all structures, walls fences or trees that are located adjacent to the adjusted lot line, sufficient to determine the location of these facilities with respect to the new lot line, if the new lot line corresponds with the exception of structures. Structures adjacent to the adjusted lot line or within 20’ must be shown so required setbacks can be verified.
- xiv. Title of Lot Line Adjustment shall include recorded map or deed information, if original parcel was created without a map. Must include the Lot Line Adjustment Number. The City of Brentwood Engineering Department will assign this number upon the first submittal.

- xv. Depict Point of Beginning (P.O.B.) or Point of Commencement (P.O.C.) as identified in legal description.

E. CERTIFICATE OF CORRECTION

1. GENERAL PROVISIONS

- a. Certificates of Correction can be used to correct certain errors or omissions on a previously recorded parcel or final map. Certificates of Correction in which more than four corrections are being processed will not be accepted unless otherwise approved by the City Engineer. In cases where more than four corrections are required an Amended Map will be required.

2. SUBMITTAL REQUIREMENTS

- a. One set electronically of the Certificate of Correction and all related materials must be submitted to the Engineering Department Representative.

2. SECOND PLAN CHECK

A. FINAL MAPS (PARCEL MAPS OR TRACT MAPS)

1. One set electronically of the subject map revised to include all the necessary revisions, changes, and/or additions noted on the initial plan check.
2. One set electronically of any revised closure calculations together with a revised coordinate map if any changes were made.
3. Return to the City **ALL** previous check prints of the Final Map and all other plan check materials.
4. The applicant shall submit a signed statement indicating that the map revisions comply with the previous plan check comments. The applicant shall also indicate any changes to the map that are not in response to the previous check comments, and shall explain any exceptions taken to the plan check comments.
5. The applicant shall submit a signed statement indicating that the final parcel or tract map satisfies all the Conditions of Approval. The statement shall also explain or clarify how the Conditions of Approval are being met.
6. Any additional information deemed reasonable and necessary by the City Engineer and the plan checker.

B. GRADING PLANS

1. One set electronically revised grading plans showing all the requested revisions, changes, and/or additions.
2. One set electronically of masonry soundwall and/or retaining wall plan showing plan, profile and special details. Applicant shall also include necessary structural

calculations and a letter from the Geotechnical Engineer stating that plans and calculations conform to report recommendations.

3. One set electronically of any other previously submitted information, which required revisions or changes.
4. Return to the City **ALL** previous check prints and plan checks materials.
5. The applicant shall submit a signed statement indicating that the grading plan revisions comply with the previous plan check comments. The applicant shall also indicate any changes to the plans that are not in response to the previous check comments, and shall explain any exceptions taken to the check comments.
6. The applicant shall submit a signed statement indicating that the grading plans comply with and satisfy all Conditions of Approval.
7. Any additional information deemed reasonable and necessary by the City Engineer and the plan checker.

C. IMPROVEMENT PLANS

1. One set electronically revised improvement plans showing all the requested revisions, changes, and/or additions.
2. One set electronically of the project composite joint trench plans (including all underground utilities, street lighting system, box and vault locations, wiring, location and layout of other public improvements, etc.) signed and stamped by the responsible Design Engineer. Submit one set electronically of traffic signal plans and specifications, if required for the project.
3. One set electronically soundwall plans, structural calculations and details and a letter from the geo-technical consultant stating that the structural calculations are in conformance with the geo-technical report and recommendations.
4. One set electronically of landscaping/irrigation systems plans (including medians, onsite, offsite, sleeving, decorative features, water service locations, etc.) signed and stamped by the responsible design professional. Including the Landscape Project Application to accompany the plan set.
5. One set electronically of any other additional previously submitted information, which required revisions or changes.
6. Return to the City **ALL** previous check prints and plan checks materials.
7. The applicant shall submit a signed statement indicating that the improvement plan revisions comply with the previous plan check comments. The applicant shall also indicate any changes to the plans that are not in response to the previous check comments, and shall explain any exceptions taken to the check comments.
8. The applicant shall submit a signed statement that the improvement plans comply with and satisfy all the Conditions of Approval.

9. Any additional information deemed reasonable and necessary by the City Engineer and the plan checker.

3. THIRD PLAN CHECK (AND SUBSEQUENT CHECKS, IF REQUIRED)

Applicant shall submit complete sets of revised final maps, grading plans, improvement plans, and all other submittal and plan check material in the same number and following the same procedures described in the preceding section. This process is continued until the applicant is notified by the Engineering Department Representative of map and/or plan approval.

An additional plan check deposit may be required by the Applicant if the previously collected deposit is not sufficient to cover the actual plan check costs or if there are significant changes to the scope or basic parameters of the proposed work. You will be notified by an Engineering Department Representative prior to the depletion of funds. It is beneficial to deposit funds immediately so as to not delay the review of your project.

4. PRIOR TO PERMIT ISSUANCE

All permit processing and inspection fees as calculated by the current Engineering Fee Schedule shall be paid to the Engineering Department.

A. SECURITY

1. Grading Permits: The applicant shall provide security for the performance of the work described and delineated on the approved grading plan and interim and final erosion and sediment control plans in an amount not less than ten percent (%) of the total estimated cost of the work. The estimated cost of work shall be approved by the City Engineer.

The type of security shall be either:

- a. Cash deposit with the City; or
 - b. A certificate of deposit approved by the City Attorney from a financial institution subject to regulations by the state or Federal government who's said financial institution pledges fund are on deposit and guaranteed for payment, and payable immediately, partially or in full to the City upon demand.
2. Encroachment Permits: The permittee shall deposit with the City security of a form approved by the City in a sum equal to the cost of the work required to be done in order to comply with all terms and conditions of the permit as estimated by the City Engineer, including a contingency of up to 20%.
 - a. On small projects (i.e., driveways, sidewalks, sewer and water service laterals, etc.), an amount equal to the cost of the work plus 20% or an amount based on the discretion of the City Engineer.
 - b. On large projects (i.e., subdivisions, commercial and industrial developments, etc.), Surety Bonds shall be submitted in a form of the approved City bond forms and issued by a surety company authorized and in good standing to do work within the State of California. The bonds shall name the City as an

oblige and shall be conditioned to ensure that each and all terms and conditions of the permit, and any agreements regarding the work shall be fully performed and complied with to the satisfaction of the City Engineer.

3. The Maintenance Bond shall be filed with the City prior to acceptance of improvements. The amount of the Maintenance bond shall be 20% for small projects and a minimum of 10% of the cost of the improvements for large projects. This amount shall be specified in the Subdivision Improvement Agreement.

In both cases, the Maintenance Bond shall be held for a period of one year. In the event of non-compliance on items that the City requires before acceptance, the City may deduct the actual cost it incurred from the deposit account. In the event of the bond having been posted, the City may proceed to take action against the surety and principal.

B. SIGNED APPROVED PLANS

Prior to issuance of approved permit, a complete set of electronically signed, approved plans bond copy must be on file with the City.

C. REQUIRED CONDITIONS

Compliance with and/or completion of any condition required prior to permit issuance.

5. PROCESSING BY CITY STAFF

- A. All applications and submittals are made to the Engineering Department Representative electronically.
- B. Prior to accepting the application for plan check, Engineering Department Representative reviews the submittal for completeness of the required information. The Engineering Department Representative will use the completed "Plan Check/Permit Submittal Application" provided by the applicant as a basis for comparison with the actual submitted items. (City of Brentwood form; see AP-A).
- C. Submittals will be accepted for plan check only if all required items and information are included. Incomplete submittals will not be accepted and will be returned to the applicant unchecked.
- D. The Engineering Department Representative will collect the required fee(s) and deposits and issue a receipt to the applicant. The Finance Department will establish a deposit account number. The initial plan check/review deposits will be made based upon the Engineer's initial cost estimate of the work (City of Brentwood form; see AP-B).
- E. The Engineering Department Representative will log the submittal and a project file started.
- F. Engineering Department Representative distributes the map and plans to Engineering and other appropriate City departments (Public Works-Operations, Planning

Department, and Building etc. Applicant should allow sufficient time for turn-around of all plan checks as described elsewhere in this manual. Review by outside agencies may increase the plan check turn-around time.

- G. Engineering returns ALL redlined plan check maps, plans, and accompanying related submittal materials to the applicant for revisions and changes. The Engineering Department Representative will note in the file the date the submittal was returned to the applicant.
- H. Where items of concern cannot be noted on the map or plans, Engineering will provide a letter to the applicant detailing the plan check comments. The information returned by Engineering to the applicant will incorporate all the comments that have been received from the various City departments and other agencies.
- I. Applicant revises the map and plans in accordance with Engineering's plan check comments and requirements. Applicant resubmits revised maps and plans, with Engineering's check prints and comments along with any requested additional information or documentation, for subsequent plan check. Submittals addressing comments from other agencies shall include said agency's red lines and/or comments.
- J. This process is continued and repeated until all the plan check comments and the project Conditions of Approval have been satisfactorily addressed, and the map and plans are ready for approval.
- K. Based on the approved Engineer's cost estimate, Engineering will calculate the necessary additional fees and prepare the final security and agreement forms for execution by the applicant/developer. Forms are transmitted to the applicant for execution.
- L. Upon notification, applicant submits the original map with all required signatures, Subdivision Agreement, securities, and fees still outstanding. All required signatures must be executed on the original map (i.e. "wet" signatures). Maps may not be submitted for signature until after the City Engineer has signed any associated public improvement plans.
- M. Upon notification, the applicant submits the original grading plans, improvement plans, and/or site development plans for City Engineer's signature. City Engineer will not sign the plans until applicant has had the plans signed by the responsible Engineer of Record, Soils Engineer, Fire District, and any other affected outside agencies (ECCID, EBRP, CCFCD, etc.).
- N. The Engineering Department Representative schedules the map for City Council action and prepares the staff report. The complete submittal shall be received by the department three weeks prior to the City Council meeting. The applicant will be notified when the Final or Parcel Map will be sent for recordation.
- O. After receiving all necessary approvals and signatures from the City, the map is transmitted to the applicant's title company for the remaining processing and recordation of the map.

- P. Within 30 days of recordation of the Final or Parcel Map, the applicant is responsible to provide one set of full-size duplicate photo mylars, (4-mil, reverse-read, matte side up) and one electronic copy of the recorded map to the City for record keeping purposes.

Important: The applicant should note that no subdivision addresses will be assigned and the City will issue no building permits until such time as the City receives these mylars and copies of the Final or Parcel Map.

- Q. Any proposed changes made during construction shall be noted and shown on the original improvement plans by the Engineer of Record, and submitted to the City for review and written approval. Revisions must be noted on the revision block on the cover sheet and each affected sheet. Revisions must be labeled sequentially. The Engineer of Record shall submit electronic copies for approval. .
- R. Engineer of Record shall submit record drawings to the Engineering Department Representative prior to final inspection and acceptance of the improvements. The record drawings shall contain all the signatures obtained from the City and other affected agencies. The record drawings shall be submitted electronically for review by the City Inspector. At approval electronic copy of the record drawings must be submitted to the Engineering Department for file.
- S. Final acceptance of public improvements will not be done until all the items of work as shown on the approved improvement plans, and any corrections, are completed. When all items are completed, the developer shall request final acceptance and, after acceptance by the City Engineer, shall be agenized for formal acceptance by City Council.
- T. Upon acceptance of the improvements by the City Council, the City Clerk releases the retained security.

6. PLAN CHECK SCHEDULE

The Engineering Department Representative will check the applicant's map and/or plan submittal as outlined in this manual. The submittal will be checked for completeness of information and to make certain that all related materials are included. **Incomplete submittals cannot be plan checked, and will not be accepted for processing.** The submittal will not be accepted for checking until all the required information has been included, and the plan check deposits have been satisfactorily made.

For submittals that satisfy the map and plan criteria and requirements, the City of Brentwood (City) intends to adhere to the following plan-check schedule:

- | | |
|-----------------------------------|---|
| First Plan Check: | Return to applicant within 20 working days of initial receipt of the submittal. |
| Second Plan Check: | Return to applicant within 10 to 15 working days of receipt of the submittal. |
| Third and Subsequent Plan Checks: | Return to applicant within five to 10 working days of receipt of plans by the City. |

In order to maintain the above schedule, timely and thorough responses to the City's comments are required by the applicant. Incomplete submittals will make it impossible for the City to meet these turnaround times. The actual length of time to complete each plan check is also dependent upon several factors that are not controlled by the City, including size of the project/number of lots; level, completeness, and accuracy of information shown on the plans; complexity of the project; and responsiveness to project Conditions of Approval and previous plan check comments.

Applicable throughout this manual, all final map and plan submittals that are prepared electronically (e.g. CAD drawn) shall be accompanied by an electronic GIS Standard file. See the section in this manual on Electronic File Submission.

7. ELECTRONIC FILE SUBMISSION

A. REQUIRED DATA

In addition to the PDF copies of all map and plan materials currently being submitted, a digital graphics file containing the following data may be included in order to facilitate transferring of the file into the City mapping system in a GIS Standard file format (see section on LAYERS for layering designations).

Coordinate System: California Coordinate North American Datum 1983 (NAD 83), Zone III, US Survey Feet.

All line work shall connect at line end points, not overlapping or coming short of connecting. Polygonal objects, such as parcels or other such boundaries, shall be created from line segments, connecting to other line work at intersections. Polygons are to be constructed from a single, closed polygon where coincidental boundaries occur. All text shall be placed in such a manner that the intersection point falls within the polygonal area.

Digital files for maps shall be submitted to the City prior to the approval of Final or Parcel Map. Upon completion of the project construction and prior to acceptance of the improvements by the City Council, digital files for all public, private, and site development improvements shall be submitted. These digital files shall contain all information shown on the approved plans; any approved changes or revisions, as well as all "As-Built" information. Any deviation from these requirements will be considered by the City Engineer on an individual project basis.

1. CHANNELIZATION/SIGNALIZATION DATA:
 Striping and Legends Traffic Signs and Signals
2. CONTOUR DATA:
 Contour Lines Contour Elevations
3. GRADING DATA:
 Pad Elevation Top of Curb Elevation
 Street Grade

4. ROAD DATA:

Right-of-Way Lines	Street Sign Location
Centerline	Median Islands
Sidewalk	Retaining/Sound Wall
Driveway	Gutter Line Location
Curb Lines	Handicap Ramp
Street Lights	Tree/Shrubs
Mailboxes	Striping

5. SURFACE DATA:

Creek/Stream	Ditch
Lake/Pond	Marsh
Park	Railroad
Trails	Canals
Wells	Tanks

6. SURVEY DATA:

Boundary Line Monument Locations	
Center Line	Lot and Parcel Lines
Easement Lines	Control Lines

7. UTILITIES DATA:

Main Lines	Poles
Controllers	Vaults
Service Laterals	Transformers
Meters and Valves	Lift Station
Cleanout	Manholes and Boxes
Culvert	Riprap
Catch Basin	

B. LAYERS

The objective of setting up a Layering Standard to be used in Digital Mapping Systems is to reduce redundancy and duplication in map maintenance.

The format for digital submissions of the graphical data, which will be accepted by the City, shall be in the DWG, SHP format, ESRI file Geodatabase. If submitting file Geodatabase data please check with the GIS Coordinator for proper ArcGIS version. As of August 2023, ESRI file geodatabases version 10.8.1 or earlier can be accepted. Typically, a readme.txt including basic contact information for questions about the data, along with all data files and folders are compressed into a single .tar, .zip, .7z or standard compression format for delivery through Dropbox or similar filesharing application.

PERMITS, FEES, INSURANCE AND SECURITY

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1. PERMITS

All necessary encroachment or grading permits, pursuant to City Municipal Code, Conditions of Approval, or other City policies and procedures, shall be obtained prior to beginning any activities. Inspection oversight and enforcement authority of construction related activities shall be provided by the City Engineer, or his designee pursuant to City Municipal Code 12.08.

2. FEES

- A. Fees for City services including, but not limited to, map checking, plan checking, document review, inspection of public and private improvements, encroachment permits, grading permits, water meters, miscellaneous processing, plan revisions, deposits, and all other processing fees associated with the applicant's requested activities shall be shown on the latest City of Brentwood Cost Allocation Plan as adopted by the City Council.
- B. Fees for various products and reproduction services, including blueprints/large Xerox, CAD-generated maps, electronic base map files, custom plots, and digital output on disk, shall be as shown on the latest City of Brentwood Cost Allocation Plan as adopted by the City Council.
- C. Deposits for review fees as outlined in the Cost Allocation Plan shall be made by the applicant/permittee concurrent with every project/permit application. The applicant/permittee's submittal will not be considered complete and City services will not begin until the appropriate deposit and/or fees have been received.
- D. Deposits amounts for project or permit review, and grading and encroachment permit fees, will be based on the projected City costs to service the applicant's request as shown on the latest Cost Allocation Plan. These deposits and fees will be calculated by the Engineering Department Representative.
- E. The applicant shall pay fees for grading and encroachment permits to the City prior to the issuance of any permit. Consideration for waiver of applicable permit fees may be requested by permittee pursuant to Council/Administrative Policy No. 10.12.

3. INSURANCE

Prior to any activities, the applicant and/or permittee will provide and maintain insurance against claims for injuries to persons or damage to property which may arise out of or in connection with permit activities. Insurance shall be provided in the following types with the following limits unless the City Engineer, in consultation with the Risk Manager and City Attorney, approves a revised amount based upon scope of work and potential risk:

A. GENERAL PERMITTEE

- 1. Commercial Liability Insurance, occurrence form, with a limit of not less than \$1,000,000-\$2,000,000.00 (dependent upon the size of the project) each occurrence. If such insurance contains a general aggregate limit, it shall apply separately to this permit or be no less than two times the occurrence limit. A Certificate of Liability shall be submitted with the City of Brentwood as Additional

Insured. It must also include the Additional Insured Endorsement, without the Endorsement the insurance will be considered invalid.

2. Automobile Liability Insurance, occurrence form, with a limit of not less than \$1,000,000.00 each occurrence. Such insurance shall include coverage for owned, hired and non-owned automobiles.
3. Workers Compensation Insurance in a least the minimum statutory limits.
4. Employers' Liability Insurance, with the minimum limits of \$1,000,000.00 per occurrence.

B. HOMEOWNER PERMITTEE

At the City's discretion, the City of Brentwood may allow copies of Home Owner Insurance certificates for review and file dependent upon the size and scope of work being proposed.

4. SECURITY

A. GRADING AND ASSOCIATED IMPROVEMENTS

1. The applicant shall provide security for the performance of the work described and delineated on the approved grading plan and interim and final erosion and sediment control plans in an amount not less than 10% of the total estimated cost of the work. The City Engineer shall approve the estimated cost of work.
2. The type of security shall be either:
 - a. Cash deposit with the City; or
 - b. A certificate of deposit approved by the City Attorney, consultation with the Director of Finance, from a financial institution subject to regulations by the State or Federal government. Said financial institution pledges funds that are on deposit and guaranteed for payment and payable immediately, partially or in full, to the City upon demand.

B. PUBLIC IMPROVEMENTS

1. Prior to issuance of a permit, the permittee shall deposit with the City security of a form approved by the City in a sum equal to the cost of the work required to be done in order to comply with all terms and conditions of the permit as estimated by the City Engineer, including a contingency of up to 20%.
2. Upon completion and prior to acceptance of work, security shall be required to warranty defect-free work and materials for a period of one year.
 - a. Amount of the security posted to guarantee the one year warranty period shall be determined by the City Engineer contingent upon scope and limits of work, though not to exceed 20% of the original value of the work.

3. Optional forms of security include, but are not limited to the following:
 - a. Surety Bonds, ie, Payment, Performance, Labor/Material, Encroachment Permit and Maintenance Bonds. (City of Brentwood Form; see AP-I, AP-J, AP-K and AP-L)
 - b. Cash Deposit; shall be double the cost of work, plus contingency, to cover both performance of the work and payment of any claims by contractors and/or suppliers.
4. Cost of the work shall be identified using City determined unit values and calculated on the approved "Unit Price for Bond Estimates." (City of Brentwood Form; see AP-B)

C. ACTION ON SECURITY

1. The City may proceed against the security posted for actual costs incurred by the City associated with any non-compliance by applicant/permittee for permit or project conditions.

D. RELEASE OF SECURITY

1. Security shall be released upon:
 - a. Satisfactory completion of work to the discretion of the City Engineer.
 - b. Compliance with all permit and/or project conditions and all other City policies, procedures or practices.
 - c. Upon necessary actions required for acceptance of work.

FINAL MAPS (PARCEL OR TRACT)

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1. MAP REQUIREMENTS

A. MAP FORM

The Final Map (parcel or tract) shall be drawn, printed or otherwise reproduced in a manner guaranteeing a permanent record in black ink. The map shall be prepared on 4 mil. mylar (reverse reading with matte surface up), having an overall size of 18" x 26".

A one-inch margin shall be left on each map edge, leaving an interior sheet size of 16" x 24". No writing or marking of any type shall be inserted within the one-inch margin. The border shall be a black indelible line having a thickness of 1/16".

B. MAP CONTENT

1. Vicinity map, which shall include the surrounding areas and nearby major roadway arterials.
2. All discrepancies with record data shall be shown.
3. Non measured record lines shall be indicated.
4. Approved access shall be indicated with street name and recorded book and page number.
5. Private streets: Note; "Not maintained by the City of Brentwood", under the approved street name.
6. Private storm drain, sanitary sewer, or any other facilities shall be so noted within appropriate easements. Include additional 5' public utility easement on the map and dedication statement.
7. Title Information: The assigned subdivision number/parcel map number shall be shown on the map. A legal description of the property is to be included under the assigned map number. The date of map preparation, north arrow and scale, in addition to the firm preparing the map, must be shown in conjunction with the assigned map number.
8. Legend: A complete legend shall be provided on each sheet indicating at least the following;
 - a. Found Monumentation: Solid
 - b. Set monuments: Open
9. Adjacent parcels shall be indicated on the map to the extent possible, including recorded map book and page number and/or the Assessor's Parcel Number (APN). Any recent subdivisions shall be noted, including any recording information.
10. Privately maintained roads shall be indicated by dashed lines. Publicly maintained roads (dedicated and accepted) shall be shown by solid lines.

11. All existing easements shall be indicated by dashed lines, with all associated dimensions referenced. Bearings, distances and ties to easements shall also be included. Holder of easement, purpose and recordation data to be referenced. Easements whose locations are not defined of record shall be noted as such on the map.
12. Tie to Basis of Bearings. Basis of Bearings shall be based on the California Coordinate System (NAD 83), 1990 Adjustment, or current adjustment as directed by the City Engineer, as established by the use of two found monuments as shown on record of survey no. 2496 (118 LSM 40).
13. All road names, widths, setback lines and required widening shall be indicated on the map.
14. Lots shall be numbered consecutively beginning with the number "1". Lots used for streets, alleys or barrier strips shall be lettered. Parcels shall be consecutively lettered beginning with the letter "A".
15. Ground to grid factor.
16. California Coordinate System Plane coordinates (NAD 83, Zone III, US Survey Feet) describing the boundaries of the subdivision.
17. The difference between true north and grid north (convergence angle) and indicate where the convergence angle is taken.
18. Common area notations required for condominium projects must appear on the map.
19. City boundaries must appear on the map when applicable.
20. Future street lines and original property lines must be indicated by dashed lines on the map.
21. Each lot or parcel must be shown completely on one sheet. If more than one sheet is required, the first sheet of the map shall contain an index map indicating limits of property covered by each sheet.
22. All lots or parcels shall show lot areas (net) in applicable English measurements.

2. CHECK LIST

A. GENERAL INFORMATION

Prior to submittal of a Final Parcel or Tract Map, a Tentative Map must have been submitted and approved. The Final Map must be submitted prior to expiration of the Tentative Map, and must be in substantial conformance with said approved Tentative Map.

If the Final Map will not be approved prior to the Tentative Map expiration date it is the Applicants responsibility to apply for a time extension with the Community Development Department.

The Final Map shall be prepared by or under the direction of a licensed land surveyor or registered civil engineer authorized to practice land surveying.

A Final Map will not be approved until all Conditions of Approval attached to the approved Tentative Map have been satisfied, and all required public improvements have been constructed and accepted by the City, or the owner posts a good and sufficient bond to complete said construction and all required agreements have been executed. Bonding requirements are contained in this manual.

State law requires the Engineer or Surveyor of Record to monument the recorded map per Article 9, "Monuments", of the Subdivision Map Act. Prior to acceptance of a Final Map for recording, a statement signed by the Engineer of Record will be required that he/she has been retained and paid for the monumentation called for on the map, and that he/she guarantees the monumentation will be set following construction, or at a date approved by the City.

B. TITLE REPORT

1. Report provided must cover the entire area as shown on the Final Map.
2. Owner's name on title report must match the name shown on the Final Map.
3. All easements listed on the title report must be shown on the map (i.e., Signature Omissions.)
4. The City shall receive a letter from all public entities or utilities that hold existing easements on the title report that they have no objections of the filing of the map.

****NOTE: TITLE REPORT MUST BE CURRENT.
TITLE REPORTS OLDER THAN 6 MONTHS WILL NOT BE ACCEPTED****

C. DEDICATIONS AND CERTIFICATIONS

The following statements are typical in general. Additional information may be required.

Final Maps must include the following statements:

Owners Statement

Trustee Statement (if required)

City Engineer (see below for correct version)

City Manager

Planning Commission Statement

City Clerk

Surveyor's Statement

City Surveyor Statement (see below for correct version)

County Recorder's Statement

Geotechnical Engineer Statement

Parcel Map must include the following statements:

Owners Statement

Trustee Statement (if required)

City Engineer Statement (see below for correct version)

Planning Commission Statement

Surveyor's Statement

City Surveyor Statement (see below for correct version)

County Recorder's Statement

Geotechnical Engineer Statement

1. OWNERS STATEMENT

THE UNDERSIGNED, BEING A PARTY HAVING A RECORD TITLE INTEREST IN THE LANDS DELINEATED AND EMBRACED WITHIN THE HEAVY BLACK LINES UPON THIS MAP, DOES HEREBY CONSENT TO THE PREPARATION AND RECORDATION OF THE SAME AND DOES HEREBY OFFER FOR DEDICATION TO THE CITY OF BRENTWOOD IN FEE FOR PUBLIC USE THOSE PORTIONS OF SAID LAND DESIGNATED ON SAID MAP AS *{list street name/s and applicable parcel/s}*.

THE AREAS DESIGNATED AS "PUBLIC UTILITY EASEMENT" OR "P.U.E." ARE HEREBY DEDICATED TO THE CITY OF BRENTWOOD OR ITS DESIGNEE FOR UNDERGROUND ELECTRIC, GAS, CABLE TELEVISION, AND TELEPHONE USE AND ANY ALL IMPROVEMENTS AND APPURTENANCES INSTALLED, INCLUDING CONSTRUCTION, ACCESS, AND MAINTENANCE EASEMENT OF THESE IMPROVEMENTS AND APPURTENANCES.

THE AREAS DESIGNATED AS SAID "P.U.E." AND/OR PUBLIC STREET/S ARE HEREBY DEDICATED TO THE CITY OF BRENTWOOD OR ITS DESIGNEE FOR FIBER OPTIC, STREET LIGHT, SANITARY SEWER, STORM DRAIN, AND WATER USE AND ANY ALL IMPROVEMENTS AND APPURTENANCES INSTALLED, INCLUDING THE CONSTRUCTION, ACCESS AND MAINTENANCE EASEMENT OF THESE PUBLIC IMPROVEMENTS AND APPURTENANCES.

THE MAP SHOWS ALL THE EASEMENTS ON THE PREMISES, OR OF RECORD WITHIN THE BOUNDARY LINES OF THE HEREIN EMBODIED MAP AS SHOWN ON THE PRELIMINARY TITLE REPORT ORDER NUMBER *{state Order Number}*, DATED *{Date}*, PREPARED BY *{Company Name}*.

THE UNDERSIGNED FURTHER RELINQUISHES TO THE CITY OF BRENTWOOD ALL ABUTTER'S RIGHTS OF ACCESS ALONG THE PROPERTY LINES ADJACENT TO *{list complete street name}* AND *{list complete street name}* IN THOSE AREAS DEPICTED HEREON BY THE SYMBOL //////////.

THE UNDERSIGNED FURTHER RELINQUISHES TO THE CITY OF BRENTWOOD ALL INTEREST IN SUB-SURFACE WATER RIGHTS BELOW 300 FEET THAT THEY MAY HAVE.

{Owner's Name}

BY:

{Signature}

{Name}
{Title}

DATE

- 2. TRUSTEES STATEMENT (when required).
- 3. SURVEYOR'S STATEMENT (including signature, seal, number and expiration date.)

THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECTION AND IS BASED UPON A FILED SURVEY IN CONFORMANCE WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCE AT THE REQUEST OF, {Name of person authorizing map}, ON {Date}. I HEREBY STATE THAT **ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITIONS INDICATED OR THAT THEY WILL BE SET IN THOSE POSITIONS BEFORE {Date} AND THAT THE MONUMENTS ARE, OR WILL BE, SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED, AND THAT AND THAT I AM SATISFIED THAT THE MAP IS TECHNICALLY CORRECT..**

DATE: _____

{Surveyor's Name}
L.S. NO #####

- 4. CITY SURVEYOR'S STATEMENT (including signature, seal, number and expiration date.)

I, {Surveyor's Name}, ACTING CITY SURVEYOR OF THE CITY OF BRENTWOOD, COUNTY OF CONTRA COSTA, STATE OF CALIFORNIA, HEREBY STATE THAT I HAVE EXAMINED THIS MAP ENTITLED SUBDIVISION {Subdivision number}, {Subdivision name}, AND THAT I AM SATISFIED THAT THE MAP IS TECHNICALLY CORRECT.

DATE: _____

{Surveyor's Name}
L.S. NO #####

5. ENGINEER'S STATEMENT

a. FINAL MAP VERSION

CITY ENGINEER'S STATEMENT (including signature, seal, and number)

I, ALLEN BAQUILAR, CITY ENGINEER OF THE CITY OF BRENTWOOD COUNTY OF CONTRA COSTA, STATE OF CALIFORNIA, HEREBY STATE THAT I HAVE EXAMINED THIS MAP, ENTITLED "SUBDIVISION *{Number}* *{Subdivision Name}*", THAT SAID SUBDIVISION IS SUBSTANTIALLY THE SAME AS IT APPEARED ON THE TENTATIVE MAP AND ANY APPROVED ALTERATIONS THEREOF, AS APPROVED BY THE CITY OF BRENTWOOD PLANNING COMMISSION ON *{Date}* THAT ALL OF THE PROVISIONS OF SUBDIVISION MAP ACT AND LOCAL ORDINANCES APPLICABLE AT THE TIME OF APPROVAL OF THE TENTATIVE MAP HAVE BEEN COMPLIED WITH.

DATE: _____

ALLEN S. BAQUILAR, CITY ENGINEER
RCE NO. 85399

- b. PARCEL MAP VERSION
CITY ENGINEER'S STATEMENT (including signature, seal, and number)

I, ALLEN BAQUILAR, CITY ENGINEER OF THE CITY OF BRENTWOOD, COUNTY OF CONTRA COSTA, STATE OF CALIFORNIA, HEREBY STATE THAT I HAVE EXAMINED THIS MAP, ENTITLED, "PARCEL MAP SUBDIVISION MS {Number}" THAT SAID SUBDIVISION IS SUBSTANTIALLY THE SAME AS IT APPEARED ON THE TENTATIVE MAP AND ANY APPROVED ALTERATIONS THEREOF, AS APPROVED BY THE CITY OF BRENTWOOD PLANNING COMMISSION ON {Date} THAT ALL OF THE PROVISIONS OF SUBDIVISION MAP ACT AND LOCAL ORDINANCES APPLICABLE AT THE TIME OF APPROVAL OF THE TENTATIVE MAP HAVE BEEN COMPLIED WITH.

I, ALLEN BAQUILAR, CITY ENGINEER OF THE CITY OF BRENTWOOD, COUNTY OF CONTRA COSTA, STATE OF CALIFORNIA, APPROVE SAID MAP AND ACCEPT ON BEHALF OF THE CITY OF BRENTWOOD PURSUANT TO BRENTWOOD MUNICIPAL CODE SECTION 16.060.040 (C) ALL PARCELS OF LAND AS OFFERED FOR DEDICATION, EASEMENTS, ABUTTERS RIGHTS OF ACCESS, AND SUBSURFACE RIGHTS IN CONFORMITY WITH TERMS OF THE OFFER OF DEDICATIONS.

DATE: _____
ALLEN BAQUILAR, CITY ENGINEER
RCE NO. 85399

- c. TENTATIVE PARCEL MAP WAIVER VERSION
CITY ENGINEER'S STATEMENT (including signature, seal, and number)

I, ALLEN BAQUILAR, CITY ENGINEER OF THE CITY OF BRENTWOOD, COUNTY OF CONTRA COSTA, STATE OF CALIFORNIA, HEREBY STATE THAT I HAVE EXAMINED THIS MAP, ENTITLED, "PARCEL MAP SUBDIVISION MS {Number}" THAT SAID SUBDIVISION IS SUBSTANTIALLY THE SAME AS IT APPEARED ON THE TENTATIVE MAP, IF REQUIRED, AND ANY APPROVED ALTERATIONS THEREOF, THAT ALL OF THE PROVISIONS OF SUBDIVISION MAP ACT AND LOCAL ORDINANCES APPLICABLE AT THE TIME OF APPROVAL OF THE TENTATIVE MAP, IF REQUIRED, HAVE BEEN COMPLIED WITH.

I, ALLEN BAQUILAR, CITY ENGINEER OF THE CITY OF BRENTWOOD, COUNTY OF CONTRA COSTA, STATE OF CALIFORNIA, APPROVE SAID MAP AND ACCEPT ON BEHALF OF THE CITY OF BRENTWOOD PURSUANT TO BRENTWOOD MUNICIPAL CODE SECTION 16.060.040 (C) ALL PARCELS OF LAND AS OFFERED FOR DEDICATION, EASEMENTS, ABUTTERS RIGHTS OF ACCESS, AND SUBSURFACE RIGHTS IN CONFORMITY WITH TERMS OF THE OFFER OF DEDICATIONS

DATE: _____

ALLEN BAQUILAR, CITY ENGINEER
RCE NO. 85399

6. NAME OF PERSON AUTHORIZING MAP.

7. CITY MANAGER STATEMENT

I, {Name}, CITY MANAGER OF THE CITY OF BRENTWOOD, COUNTY OF CONTRA COSTA, STATE OF CALIFORNIA, DO HEREBY STATE THAT THIS MAP ENTITLES “{Number}”{Subdivision Name}”, WAS PRESENTED TO ME, PURSUANT TO CITY OF BRENTWOOD MUNICIPAL CODE SECTION 16.165, AND I DID THEREUPON APPROVE SAID MAP AND ACCEPT ON BEHALF OF THE CITY OF BRENTWOOD, ALL STREETS AND PARCELS OF LAND IN FEE AS OFFERED FOR DEDICATION, EASEMENTS, ABUTTER’S RIGHTS OF ACCESS AND SUBSURFACE WATER RIGHTS, IN CONFORMITY WITH THE TERMS OF OFFER OF DEDICATION.

I FURTHER STATE THAT PURSUANT TO THE CITY OF BRENTWOOD’S MUNICIPAL CODE SECTION 16.166, ALL AGREEMENTS AND BONDS REQUIRED BY LAW TO ACCOMPANY THE MAP HAVE BEEN EXECUTED AND ARE ON FILE IN THE OFFICE OF THE CITY CLERK.

IN WITNESS WHEREOF I HAVE HEREUNTO SET MY HANDS THIS _____ DAY OF _____ 20__.

DATE: _____

{Name}
CITY MANAGER

8. PLANNING COMMISSION STATEMENT

I, {Name}, COMMUNITY DEVELOPMENT DIRECTOR OF THE CITY OF BRENTWOOD, HEREBY STATE THAT THE PLANNING COMMISSION HAS APPROVED THE TENTATIVE MAP ON _____ {Date} OF SUBDIVISION {Number} {Subdivision Name}, WHICH INCLUDES THIS SUBDIVISION, UPON WHICH THIS FINAL MAP IS BASED.

DATE: _____

{Name}
COMMUNITY DEVELOPMENT DIRECTOR

9. ACKNOWLEDGEMENT

STATE OF CALIFORNIA)
COUNTY OF {County Name}) S.S.

ON {Date}, 20___, BEFORE ME, {Notarian's Name}, NOTARY PUBLIC PERSONALLY APPEARED {Name} PERSONALLY KNOWN TO ME (OR PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE) TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME IN HIS AUTHORIZED CAPACITY, AND THAT BY HIS SIGNATURE ON THE INSTRUMENT THE PERSON, OR ENTITY UPON BEHALF OF WHICH THE PERSON ACTED, EXECUTED THE INSTRUMENT.

WITNESS MY HAND,

SIGNATURE: _____
NOTARY PUBLIC IN FOR THE COUNTY OF: _____ {County}
STATE OF: _____ {State}
PRINCIPAL PLACE OF BUSINESS: _____ {County} COUNTY
COMMISSION EXPIRES: _____ {Date}

10. COUNTY RECORDER'S STATEMENT

THIS MAP, ENTITLED "SUBDIVISION {Number} {Subdivision Name}, IS HEREBY ACCEPTED FOR RECORDATION, SHOWING A CLEAR TITLE AS PER LETTER OF TITLE WRITTEN BY {Title Company}, DATED THE {Day} DAY OF {Month}, 20___, AND AFTER EXAMINING THE SAME, I DEEM THAT SAID MAP COMPLIES IN ALL RESPECTS WITH THE PROVISIONS OF STATE LAW AND LOCAL ORDINANCES GOVERNING THE FILING OF SUBDIVISION MAPS.

RECORDED AT THE REQUEST OF {Requester's Name} AT {Time} A.M. /P.M. ON THE {Day} TH DAY OF {Month} , 20___ IN BOOK _____ OF MAPS, AT PAGE _____ IN THE OFFICE OF THE COUNTY RECORDER OF CONTRA COSTA COUNTY, STATE OF CALIFORNIA.

COUNTY RECORDER
COUNTY OF CONTRA COSTA
STATE OF CALIFORNIA

BY: _____
DEPUTY COUNTY RECORDER

11. GEOTECHNICAL SOILS REPORT (include company name, report number and date)

A SOILS REPORT HAS BEEN PREPARED BY *{Individual or Company's Name}* PROJECT NO. *{Reference Project No.}* DATED *{Date}*, AND IS ON FILE IN THE OFFICE OF THE CITY ENGINEER OF THE CITY OF BRENTWOOD, COUNTY OF CONTRA COSTA, STATE OF CALIFORNIA.

12. CLERK OF THE BOARD OF SUPERVISORS' STATEMENT

I HEREBY STATE, AS CHECKED BELOW, THAT:

A TAX BOND ASSURING PAYMENT OF ALL TAXES WHICH ARE NOW A LIEN, BUT ARE NOT YET PAYABLE, HAS BEEN RECEIVED AND FILED WITH THE BOARD OF SUPERVISORS OF CONTRA COSTA COUNTY, STATE OF CALIFORNIA.

ALL TAXES DUE HAVE BEEN PAID, AS CERTIFIED BY THE COUNTY REDEMPTION OFFICER.

DATED: _____ *{Name}* _____
CLERK OF THE BOARD OF SUPERVISORS
AND COUNTY ADMINISTRATOR
COUNTY OF CONTRA COSTA
STATE OF CALIFORNIA

13. Dedication of public service easements, public utility easements, sanitary sewer, and all other dedications of public use.
14. Dedication of drainage, irrigation and Flood Control easements.
15. Certificate of Dedication for same public purpose (per Subdivision Map Act 66477.5). " _____ has dedicated hereon certain public rights of way for _____ (street name.) The City of Brentwood shall reconvey the property to _____ or its successor in interest. If the City of Brentwood subsequently makes a determination pursuant to the provision of section 66477.5 of the Subdivision Map Act that the same public purpose for which the property was dedicated does not exist or the property or any portion of the property thereof is not needed for public utilities, except for all or any portion of the portion of the property that is required for that same public purpose or for public utilities."
16. Consent to Dedication forms executed by all existing easement holders over areas being dedicated for roadway purposes.
17. Waiver of signatures on map from public utilities or public entities, if necessary (per Subdivision Map Act, Section 66436).
18. Easement Dedications to be appropriately reflected in Owner's Certificate and the purpose of the easement indicated on the map, including the additional five foot public utility easement.

19. Other certificates, statements, and acknowledgments required by statute, local ordinance, or the City Engineer.

D. MONUMENTATION

1. All found monuments of record shall be tied by survey and described with tag numbers and recorded reference. Indicate "Record Data" within parenthesis for all boundary and monumentation information that differs from the field survey.
2. Basis of Bearings shall be based on the California Coordinate System (NAD 83), 1990 Adjustment, or current adjustment as directed by the City Engineer, as established by the use of two found monuments of record on a single line from that Record Map. The Basis of Bearings must appear in a statement and be labeled on each sheet of the map.

Datum Statement may be similar to the following:

THE BASIS OF BEARING FOR THIS MAP IS DETERMINED FROM FOUND MONUMENTS SHOWN HEREON: THE BEARING BEING *{state bearing}* BETWEEN STATION *{station no.}* AND STATION *{station no.}* AS SHOWN ON RECORD OF SURVEY NO. 2496 (118 LSM 40). CALIFORNIA COORDINATE SYSTEM ZONE III (NAD 83). MULTIPLY DISTANCE AS SHOWN BY *{0.9999####}* TO OBTAIN GRID DISTANCES.

3. Tie to basis of bearings.
4. Tie to adjoining surveys.
5. Monumentation in conformance with the Subdivision Map Act, local ordinance, and the requirements specified in this manual.
6. Monument boxes required in existing or proposed roads per current City of Brentwood Standards St-26.
7. Monumentation of right-of-way at B.C., E.C., angle points, and property line, if necessary, or if directed by the City Engineer.
8. Minimum 2" diameter, 18" long iron pipe set in concrete in a well-monument per City standards is required at all section, quarter-section and rancho corners, as well as at major street intersections.
9. A monument line shall be shown on all new subdivision streets, with 1" diameter, 18" long iron pipe set in concrete, monuments set on centerline or as otherwise approved by the City Engineer and with ties to rights-of-way.
10. 5/8" diameter 18" long iron pipes are to be set at all significant boundary lines, angle points and shall be shown on the map.
11. Other monumentation as required by statute, local ordinance, or the City Engineer.

E. MATHEMATICAL ACCURACY AND GEOMETRY

1. All bearings, distances and curve data shown to nearest one hundredth of a foot, and to nearest second.
2. All curve data included (delta, radius length, and tangent).
3. Radial bearing and non-tangent curve data.
4. Sum of increments must equal the total distance or delta.
5. Net or gross areas must be shown to nearest one hundredth of a square foot.
6. Roadway radii shown.
7. Street widths, setbacks and or required widening must be shown on the map.
8. Closure calculations must be submitted along with the Final Map. Closure calculations must close within 1:20,000. Closure calculations must be performed for the subdivision boundary, each lot or parcel, each grouping of lots or parcels, monuments, and right-of-ways; and must close as described above. Closure calculations must agree precisely with the bearings and distances shown on the Final Map. Forced closures will not be accepted.

3. PARCEL MAP WAIVER

A. GENERAL INFORMATION

Upon request of the property owner/subdivider, the Community Development Director and City Engineer, pursuant to Government Code §66428 (b) and Brentwood Municipal Code Section 16.060.050 "Waiver of parcel map.", may waive the requirement for a parcel map.

B. REQUIREMENTS

1. Payment of fees and land dedication as identified in this Code, the City's Development Fee Program and other policies as established by the City and all other jurisdictional agencies relating to payment of fees, division of land and development; and
2. Any property specific requirements that may be conditioned for division of land and development, and
 - a. Deferral of conditioned improvements pursuant to the City 'municipal Code 16.166.020 and
 - b. Environmental Review pursuant to the California Environmental Quality Act.

C. REQUIRED DOCUMENTS

1. Legal and Plats prepared as per Section V, Titled Legal and Plats/Certificate of Correction Preparation.
2. Closure calculations prepared as per Section IV, (E) Mathematical Accuracy and Geometry.
3. Current title report (within 6 months)

D. PROCESSING

Upon approval of the parcel map waiver requirements, the City Engineer will sign and the City will send the Certificate of Compliance to the title company for recordation.

LEGALS & PLAT AND CERTIFICATE OF CORRECTION PREPARATION

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1. LEGALS & PLATS

A. FORMAT

1. Legals and Plats shall be drawn or otherwise reproduced in a manner guaranteeing a permanent record in black ink on a sheet size of 8½" x 11".
2. The plat shall be drawn to 1" = 20' scale unless otherwise specified by the City Engineer. It shall show the following applicable information as well as any other information necessary to adequately describe the property, easements or dedications.
 - a. Each lot in its entirety.
 - b. All bearings and distances, all curve data including the delta, radius length and radial bearing, if not perpendicular to tangent line.
 - c. Areas of lots and dedications.
 - d. Assessor's parcel number.
 - e. All existing easements.
 - f. Tie to the nearest existing monument for basis of bearing.
 - g. Abutting streets and alleys showing names, centerlines, widths and monuments (with LS No. and recording map information).
 - h. Tie to basis of bearings. Basis of Bearings shall be based on the California Coordinate System (NAD 83), 1990 Adjustment or current adjustment as directed by the City Engineer, as established by the use of two found monuments as shown on record of survey no. 2496 (118 LSM 40)
 - i. Areas to be dedicated shall be shown and clearly called out on plat. Hatch-mark areas to be transferred.
 - j. Vicinity Map at a scale of approximately 1" = 200'.
 - k. North arrow and scale.
 - l. When preparing legals and plats for in fee right-of-way dedication please use wording "In Fee" and not "Dedication" or "Right of Way".

2. CHECKLIST

A. GENERAL INFORMATION

1. Some projects may require the Developer to obtain right-of-way or certain easements for roadway purposes, utilities, landscaping or other requirements as part of the Project Approval. It is the responsibility of the Developer to ensure all right-of-way dedications and easements are acquired and processed in a timely manner.
2. The legals/plats and face sheet must be reviewed by the City Engineering staff to ensure accuracy and verification it meets requirements of approval.

B. TITLE REPORT

1. A title report that is current (within 6 months) must be submitted in addition to the legals and plats. The legals and plats will not be approved without a current title report, no exceptions will be made.

C. GRANT DEED DOCUMENTS

1. Legals and plats shall be reviewed prior to Grant Deed documents being signed by the property owner. No property owner shall sign Deed documents prior to having the City approved legals and plats attached. It is the responsibility of the Developer to ensure the legals and plats are completed and ready for approval by the property owner. If the Grant Deeds are received prior to approval it will be returned and it will require an additional signature from the property owner once legals and plats have been reviewed and approved by the Engineering Department.

3. CERTIFICATE OF CORRECTION

A. GENERAL INFORMATION

It may be necessary to file a Certificate of Correction or an Amended Map after a Final Map or Parcel Map has been recorded. If more than five changes are being made a Certificate of Correction will not be accepted, an Amended Map must be submitted for review and approval. A Certificate of Correction or Amended Map may be used for the following purposes:

1. To correct an error in any course or distance.
2. To show any course of distance that was omitted.
3. To correct an error in the description of the real property shown on the map.
4. To indicate monuments set after the death, disability, retirement from practice, or replacement of the engineer or surveyor charged with responsibilities for setting monuments.
5. To show the proper location or character of any monument which has been changed in location or character originally was shown at the wrong location or incorrectly as to its character.
6. To correct any additional information filed or recorded pursuant to Section 66434.2, if the correction does not impose any additional burden on the present fee owners of the real property and does not alter any right, title, or interest in the real property reflected on the recorded map.
7. To correct any other type of map error or omission as approved by the City Engineer that does not affect any property right, including, but not limited to, lot numbers, acreage, street names, and identification of adjacent record maps.

B. FORMAT

1. The amending map or certificate of correction must be prepared and signed by a registered civil engineer or licensed land surveyor.
2. The amending map or certificate of correction shall set forth in detail the corrections that are being made and must show the names of all fee owners of the

real property affected by the correction or omission on the date of the filing or recording of the original final or parcel map.

3. The certificate of correction shall have a signature block for the City Engineer to sign and approve.

C. REQUIRED DOCUMENTS

The certificate of correction shall be submitted to the Engineering Department for review. Reference documents shall be submitted for review, this includes the previous recorded map along with any documents that may be useful to staff.

D. PROCESSING

Upon submittal of the Certificate of Correction the Engineer staff will review the Certificate for compliance. Upon approval the City Engineer will sign and the City will send the Certificate of Correction or Amended Map to the title company for recordation.

GRADING PLANS

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1. GRADING PLAN FORM

- A. Grading plans shall be drawn, printed, or otherwise reproduced in a manner guaranteeing a permanent record in black ink. The plans shall be prepared having an overall size of 24" x 36". Every plan sheet shall be signed with seal or stamp and expiration date, by the responsible design engineer. In addition, the plans shall have a statement signed and sealed by the project soils/geologic engineer indicating that the plans comply with the recommendations contained in the project soils report. Submittals that are not properly signed and sealed will not be accepted for plan check.
- B. A one-inch margin shall be left on each plan sheet edge, leaving an interior sheet size of 22" x 34". No writing or marking of any type shall be inserted within the one-inch margin. The border shall be black indelible line having a thickness of 1/16". Grading plans shall be at 20 or 30 scale. Plans will be accepted at 40 scale only if extraordinary clarification is not required to show the proposed scope of the work and when approved by the City Engineer. All sheets shall be at the same scale and orientation. North shall be toward the top or left of the standard sheet.

2. PLAN REQUIREMENTS

A. GENERAL INFORMATION

- 1. The site address or location and assessor's parcel number.
- 2. The owner's representative name, address and phone number.
- 3. Vicinity map, sheet index and key map with scale at 1" = 100'.
- 4. Temporary and permanent benchmarks including their descriptions in conformance with the City of Brentwood Record of Survey RS 2496 (118 LMS 40) NAD 83, Zone III US Survey Feet.
- 5. General grading notes on the title sheet and specific grading notes applicable to that sheet on the remaining sheets.
- 6. Project Specific conditions of approval shall be shown on plans.
- 7. Use the current standard title block and sheet layout (see sample plan sheet). The sample plan sheet is available in electronic file format from the City.
- 8. All work within Highway 4, other State of California right-of-way, is subject to Caltrans review and approval. Pacific Gas & Electric, Contra Costa Water District, East Bay Municipal Utility District, East Contra Costa Irrigation District, East Bay Regional Park District or other agency's right-of-way is subject to their review and approval.
- 9. Signature blocks for all applicable governing agencies and City departments.

The City Engineer's signature block shall appear on the cover sheet of each plan set as follows:

REVIEWED FOR CONFORMANCE WITH CITY OF BRENTWOOD STANDARDS AND REQUIREMENTS. APPROVAL FOR CONSTRUCTION IS SUBJECT TO THE INFORMATION SHOWN HEREIN. CITY OF BRENTWOOD AND THE UNDERSIGNED ARE NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS THAT MAY EXIST ON THESE PLANS.

ALLEN BAQUILAR
CITY ENGINEER
RCE NO. 85399

DATE

The Community Development Director's signature block shall appear on the cover sheet as follows:

{Name}
COMMUNITY DEVELOPMENT DIRECTOR

DATE

10. Date drawing completed.
11. Soil's Engineer's signature and seal with expiration date on all sheets.
12. The names, addresses, and phone numbers of the supervising civil engineer, the soils engineer and the grading contractor; those of the grading contractor could be optional in the event that he/she has not yet been selected.
13. The volume of cut and fill needed, including those quantities generated by shrinkage, shrinkage factor, subsidence and over-excavation of pad areas, footing excavation, utility spoils as determined by the soils engineer.
14. Property lines and boundaries.
15. North arrow, scale and legend on all sheets.
16. Show use permit number or subdivision name and tract number in all title blocks of the set of plans.
17. Adjacent sheet numbers shown. All sheets numbered consecutively with project name and number on all sheets of the set of plans.
18. Give reference number for adjoining grading and improvement plans.
19. Provide the Contra Costa Flood Control Drainage Area Number.

B. GRADING PLAN CHECKLIST

1. The proposed use of each parcel.
2. Accurate contours showing the present topography of the grading site and adjacent property; existing and proposed contours shall be shown at intervals of one foot or less on slopes up to five percent, and not more than five feet on slopes

in excess of five percent, and shall extend a minimum of 50' past the limits of grading (or as required by the City Engineer) in all directions and no less than is necessary to show the potential off site effects to or caused by the graded site. Show all cuts and fills with continuous "daylight" lines.

3. Site development plans generally shall include the information specified along with the building pad elevation finished floor elevation, individual lot drainage pattern, adjacent land drainage, driveway size and locations, fencing, existing contours, existing trees, wells, ditches and other landmarks important in the construction of the improvements. In addition, adjacent lot grades shall be shown for a minimum of 25' from the project boundary along with the direction of drainage of adjacent property. The site development plan shall conform to F.H.A. standards. When necessary, detailed section of the pad and foundation shall be included to show and clarify any special grading conditions, retained fills, special backfill, differences in grade, etc.
4. Elevations, dimensions, locations, extents, and slopes of all proposed grading, by contours or other means, including: finish curb at points of extension of lot lines and curb return points; finish and existing grades at each principal corner for the structure or the graded pad; points of change and grades of the pad grading; hinge lines and points of change in slope of the pad or lot grading; and center of driveway elevation at property line and curb face. Elevations at all lot corners. Contours and elevations shall be on the same datum as the Tentative Map and improvement plans.
5. Plans shall clearly show the existing and proposed overland drainage patterns and flows, including historical agricultural flows. Grading shall not block or impede the existing overland drainage from adjacent contiguous parcels. Any diversion, increased flow, or concentration of drainage runoff, requires a drainage acceptance letter from the downstream parcel owner.
6. Adequate drainage notes and specifications. Entire lot drainage pattern and disposition of surface and roof drainage. Roof, rear yard, patio, etc., impervious areas drainage is to be collected and conveyed in a closed pipe to the street gutter through the curb. Swales with a minimum slope of one percent shall be provided to drain rear and side yards; grade from all structures to drainage swales shall to be a two percent minimum, sloping away from the structure, unless otherwise allowed or required by the project soils engineer.
7. Top and toe of all cut and fill slopes.
8. Location of any buildings, structures, driveways, drainage ditches, or elements of the project such as pool, patio, tennis court, etc., on or within 25' of the property where the work is to be performed.
9. Location and height of all retaining walls (Note: Retaining walls with a height of one foot or more shall be reinforced concrete, concrete blocks or masonry, structural design calculations shall be submitted and shall be approved by the City Engineer prior to construction, see Standard Plan G3a thru G4b).

10. Detailed plans of all drainage devices, walls, cribbing, or other protection devices to be constructed as part of the proposed work.
11. How finish grades join contiguous properties and setbacks from property lines in all directions.
12. Existing easements, streets with centerlines, sewer, storm drain, and access easements, existing and proposed.
13. The location and species of all trees having a trunk diameter of one and a half inches or greater or, if massed, the outline of the tree mass. Trunk diameters of six inches or greater, measured 42" above ground level shall be noted for all species.
14. All cut and fill control specifications and/or reference to the project Geotechnical Report and the recommendations contained therein.
15. Provisions for protecting adjacent properties and/or existing improvements during construction. Any proposed grading on adjacent parcel(s) requires a grading acceptance letter from the adjoining property owner(s).
16. Erosion control and/or slope protection.
17. Desilting basins for any adjacent agricultural land.
18. Owner, developer or agency shall provide pad elevations one-foot above the 100-year base flood elevation as shown on the latest Flood Emergency Management Association (FEMA) flood plain maps for Contra Costa County, California. The developer shall be responsible for all necessary activities, applications, documentation and costs to amend floodplain maps for their development. The reference document is commonly known as "Letter of Map Amendment Revision" (LOMAR).
19. Provide typical cross-sections for the boundary of the project, to depict the impact to the surrounding areas.

3. OTHER ITEMS TO BE INCLUDED AND SUBMITTED WITH THE GRADING PLAN(S)

- A. Erosion and sediment control plans. Plan preparation shall satisfy current State of California Storm Water Pollution Prevention Plan (SWPPP) requirements.
- B. Copy of owner's "Notice of Intent" Storm Water Pollution Plan, submitted to the Regional Water Quality Control Board, if applicable.
- C. Hydrology maps with drainage sheds and sub-sheds.
- D. Calculations for any hydraulic structures need to be supplied for review. Hydraulic structures include: pipes, storm drains, catch basins, drainage ditches, rip-rap, gabion and erosion control measures.
- E. Drainage acceptance and grading acceptance letters from adjacent property owners.

- F. Grading and/or drainage plans of adjacent subdivisions and land development projects.
- G. All retaining walls required for the rough or fine grading of the site shall be depicted in detail on the plan and structural calculations submitted along with the plans.
- H. Soils Report (Current within a year prior to the grading plan approval by the City Engineer)

1. Soils Engineering/Engineering Geology and Reports

The following soil and geologic factors shall be addressed in the Geotechnical Reports required for each site. Design recommendations shall be made from information gathered by physical inspection of the site and laboratory tests. Soils reports shall be site specific and are to be prepared and submitted for individual subdivisions and/or project sites. Reports prepared for adjacent sites will not be considered for the subject project site unless the report specifically addresses and makes recommendations to the project site.

Not all of the following items will apply to each site, nor it is intended to encompass all possibilities, but is included as a minimum standard for geotechnical reports:

2. Geologic Conditions

The following geologic conditions should be addressed in the report regardless of whether it is a geologic, geotechnical or soils report:

- a. Previously mapped landslides on the site as well as any known recent earth movements and citation/ reference source.
- b. The basic geologic units, their strength properties and how the geometry of these units affects the site.
- c. The seismic environment, including the nearest active faults, the probable magnitude and recurrence interval of earthquakes that could be expected, and peak bedrock accelerations that could be anticipated at the site.
- d. Public occupancy buildings (such as fire stations, hospitals, schools, hotels and multi-story buildings requiring a structural engineer), need an earthquake engineering section in the report detailing site period, ground response and design parameters. A dynamic site response analysis might be required for the first three categories listed above. These categories may be expanded by the City Engineer.

3. Subsurface Conditions

The following items should be addressed in the report with regard to what lies below the surface of the ground at the site.

- a. The types of soils or bedrock encountered.
- b. The in-situ dry density and moisture content of those units.
- c. Presence and depth of any groundwater encountered.
- d. Standard Penetration Tests (SPT) blow count may be used for strength characteristics in either saturated clays or sandy units.

- e. Block or drive samples for unsaturated clays are required to evaluate the engineering properties thereof.
- f. Saturated clays may be sampled by drive or piston sampler for the purpose of consolidation testing to evaluate settlement potential on sites.

4. Laboratory Testing

The following laboratory tests, as applicable to site conditions, are considered the minimum necessary to deduce soil engineering properties at any given site. Each report should stand on its own.

- a. Classification tests: These consist of sieve analyses and plasticity index test results used to classify each soil type encountered, using the Unified Soil Classification system.
- b. Soil strength tests: Either tri-axial or direct shear tests may be used. These tests should be saturated and drained when evaluating long term problems (as in slope stability) and may be run undrained when evaluating short-term problems (such as retained excavations and trench slope stability problems). Each significant soil type, or weakest soil type, must be tested.
- c. Consolidation tests: are required to estimate settlements in clayey soils and may be required when fills are placed upon clayey units that could consolidate.
- d. Expansion tests: (such as UBC Standard 29 1) should be used when clays are expected to be within five feet of finished grade (a plasticity index correlation to expansion potential alone is not sufficient). Very high expansion quality can be assumed for design purposes in lieu of this test.
- e. Compaction tests: When soils are to be used in either engineering fills or for the backfill of retaining walls, a compaction test run in accordance with ASTM D1557 78 is required in order to estimate fill densities.
- f. Permeability testing: When subsurface drainage is required, permeability tests, and a sieve analysis (to determine piping potential and requirement for filter design) shall also be conducted, or a recommendation for the thickness of a gravel base under the sub drain should be included.
- g. Stabilometer Tests: R-values for subgrade soils, run in accordance with California Test Method 301, will be required for paving recommendations.
- h. pH: Hydrogen ion concentration testing is required for all import and trench backfill. The pH value shall be within 6.5 to 7.5 range.
- i. Resistivity: Minimum resistivity testing in accordance with California Test Method 643 will be required for buried steel structures such as pipes or piles. The minimum resistivity (fully saturated) shall be 10,000 ohm-centimeters.

5. Report Recommendations

The soils, geologic or geotechnical engineering report should have recommendations that cover the following topics as are appropriate for the site specific subdivision and/or development site and the proposed construction:

- a. Foundation Type and Capacity: These recommendations should have supporting laboratory tests and other rational analysis or prior experience cited to justify them.

- b. Settlement Potential: This should address how much settlement potential is expected on the site and when it will occur.
- c. Presence of Expansive Soils: Expansive soils can have very detrimental effects on building structures. Special mitigation measures such as, but not limited to, foundation and drainage are normally recommended for these conditions.
- d. Lateral Loads: Recommendations for passive, active and at rest lateral loads (with supporting laboratory test data) should be tailored to current site conditions, as well as construction conditions and the future as built site conditions.
- e. Slope Stability: Slope stability should be quantitatively evaluated with supporting data stated. The type of analysis, the soil parameters used and other assumptions used in the analysis should also be stated. An appendix with the actual calculation (computer printout is sufficient) is recommended, but not necessarily required.
- f. Grading: Recommendations should be given for cut and fill slope inclinations, surface and subsurface drainage, depth of hills, settlement potential and repairs of failed slopes. The location and depth of any areas requiring over excavation should be indicated in the report, as well as procedures for the grading of keyways, buttresses or other sensitive areas. There should be a laboratory maximum density curve or curves run on the materials expected to be used for the fill. Recommendations and evaluations should be appropriate to the size of the development and the height of the earthworks contemplated. The expected shrinkage in fill areas shall also be noted.
- g. Paving: Pavement design in the area of both private and public roads is subject to the approval of the City Engineer and shall in all cases conform to the minimum standards of the City of Brentwood. Paving standards shall be arrived at through a rational analysis of the subgrade soil types encountered, with the worst soil type being tested and evaluated. Caltrans design procedures shall use California Test Method 301. Recommended Pavement Sections for, roadways, parking and traffic areas shall be included in the report. No pavement section recommendations shall be less than City standards.
- h. Soil Corrosivity: Corrosivity testing of the soils present as well as any planned import embankment, fill, or backfill materials is required. California Tests Method procedures shall be used to determine both the pH of the soil system and its lowest relative resistivity. This test shall include valves for chloride and sulfates.

4. IMPORT/EXPORT OF EARTH MATERIALS

The following requirements shall be observed when earth material is being transported to/from the construction site:

- A. The quantity of import/export shall be shown on the grading plan, including the calculations on how it was obtained, including raw cut, raw fill, shrinkage, subsidence, footing spoils, and utility spoils.
- B. The material shall be transported in a manner approved by the City Engineer.

- C. Material to be exported or excavated material to be utilized on another portion of the site shall not remain stockpiled on site for more than five working days. Special circumstances may prevent the placement or removal of the stockpile, in which case written approval from the City Engineer will be required to exceed the five day period.
- D. Import material shall not be stockpiled on site more than five working days prior to its ultimate placement.
- E. Either water, or dust palliative, or both shall be applied for the alleviation or prevention of excessive dust resulting from the loading or transportation of earth to or from the project site on public roadways. The permittee shall be responsible for maintaining public rights-of-way used for handling purposes in a condition free of dust, earth, or debris resulting from the grading operation. Stockpile shall be kept covered and secure from creating dust.
- F. Loading and transportation of earth to or from the site shall be conducted between 7:30 a.m. and 3:30 p.m., Monday through Friday, unless written application for alternate hours is made to and approved by the City Engineer.
- G. Access roads to the premises shall be at points designated on the approved grading plan only.
- H. The last 50' of the access road, as it approaches the intersection with the public roadway, shall have a 300' clear, unobstructed line of sight to the intersection from both the public roadway and the access road. If the 300' sight distance cannot be achieved, flag persons shall be posted.
- I. A stop sign conforming to the requirements of Section 21400 of the California Vehicle Code shall be posted at the junction of the access road and the public roadway.
- J. An advance warning sign must be posted on the public roadway in advance of the access intersection. The placement shall be as dictated in the California Supplement to the Manual of Uniform Traffic Control Devices (MUTCD) and shall read "Truck Crossing". The sign shall be diamond in shape, each side being 30" in length, having a yellow background, and the letters thereon shall be five inches in height. The sign shall be placed six feet from the edge of the pavement, and the base of the sign shall be five feet above the pavement level if no pedestrian activity exists in the area, or seven feet above the pavement level if pedestrian activity is allowed. The advance warning sign shall be covered or removed when the access intersection is not in use.
- K. The applicant's failure to dispose of any import/export material within the stated time frame may result in a fine, or the suspension or revocation of the permit, at the discretion of the City Engineer.

5. HAUL ROUTES

The Contractor's proposed haul route shall be submitted for review and approved by the City Engineer for any site requiring import/export of any earth materials. This will serve to prevent the use and congestion of public rights-of-way which cannot adequately support this type of traffic. No grading permits shall be issued until the proposed haul routes have been reviewed and approved. The City Engineer shall be notified if any alternate route will be used. This

alternate shall not be utilized until such time that it is approved. Failure to obtain approval of proposed or alternate haul routes may result in a fine, or the suspension of the grading permit, at the discretion of the City Engineer.

The current City of Brentwood approved truck routes are as follows:

- Lone Tree Way
- Brentwood Blvd.
- Balfour Road (between Walnut Blvd. and Brentwood Blvd.)
- Walnut Ave. (south of Balfour Road)

6. CONDITIONS OF APPROVAL

Approval of grading permits shall be made subject to the appropriate conditions or reservations required to protect public health, safety, and general welfare, including but not limited to the following:

- A. Completion of the work within a period approved by the City Engineer.
- B. Reasonable provisions for controlling excessive dust.
- C. Hours of operation.
- D. Safety precautions to guide pedestrian and vehicular traffic in, around, and by the operation.
- E. Posting of a good and sufficient bond to assure compliance with the conditions.
- F. Other conditions deemed necessary by the City Engineer, and based upon accepted engineering practices.

7. PROTECTION OF ADJOINING PROPERTY

No work shall be undertaken which may result in damages to, obstruction of, or possible hazards to any adjoining property. Whenever any portion of the work requires entry onto adjacent property for any reason, the permit applicant shall obtain the written consent of the adjacent property owner or his/her authorized representative, and shall file a copy of the consent with the City Engineer before a permit for such work may be issued.

Research historical irrigation patterns including irrigation runoff and assure continued drainage and inflow to a City facility, the system must include desilting of the agricultural runoff.

**IMPROVEMENT PLANS (CONSTRUCTION, TRAFFIC, CATHODIC PROTECTION,
LANDSCAPE AND IRRIGATION, SOUND AND RETAINING WALLS)**

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1. PLAN REQUIREMENTS

Improvement plans shall be drawn, printed, or otherwise reproduced in a manner guaranteeing a permanent record in black ink. The plans shall be prepared having an overall size of 24" x 36". Every plan sheet shall be signed, with seal or stamp and expiration date, by the responsible design engineer. Submittals that are not signed and sealed will not be accepted for plan check.

A one-inch margin shall be left on each plan sheet edge, leaving an interior sheet size of 22" x 34". No writing or marking of any type shall be inserted within the one-inch margin. The border shall be black indelible line having a thickness of 1/16". All sheets shall be at the same scale and orientation. North shall be toward the top or left of the standard sheet.

Improvement plans for public and private development projects shall be prepared in accordance with the Engineering Design Standards and submitted to the City Engineer for plan check and approval.

A. GENERAL INFORMATION

1. Key Map with legend at 1" = 100'; sheet index and legend.
2. Project address or location and assessor's parcel number.
3. Vicinity map showing project location.
4. North arrow and scale on all sheets.
5. General construction notes on title sheet and construction notes applicable to that sheet on remaining sheets (referencing City of Brentwood Standard Plan numbers).
6. Project Specific Conditions of Approval.
7. Signature blocks for all applicable governing agencies and City Departments (City Engineer for all improvements, Community Development Director and Parks and Recreation Department for Landscape/Irrigation Plans; and CCC Fire Protection District).

The City Engineer's signature block shall appear on the cover sheet of each plan set as follows on the next page:

REVIEWED FOR CONFORMANCE WITH CITY OF BRENTWOOD STANDARDS AND REQUIREMENTS. APPROVAL FOR CONSTRUCTION IS SUBJECT TO THE INFORMATION SHOWN HEREIN. CITY OF BRENTWOOD AND THE UNDERSIGNED ARE NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS THAT MAY EXIST ON THESE PLANS.

ALLEN BAQUILAR, CITY ENGINEER

DATE

8. Temporary and permanent benchmarks including their descriptions, in conformance with City of Brentwood record of Survey RS 2496 (118 LSM 40), NAD 83 Zone III, US Survey Feet.
9. Plan view showing the entire street right-of-way layout (Scale 1" = 100') proposed water and sewer mains, storm drainage system, lot numbers, streetlights, flow arrows, and other miscellaneous improvements to be installed. Show pipe sizes.
10. Standard title block located along lower edge (See sample plan sheet in the Appendix section. Electronic file is available upon request.)
11. Date drawing completed.
12. Typical street sections for each varying street width.
13. Owner's representative name, address, and telephone number (title sheet).
14. Design Engineer's name, address and telephone number (title sheet).
15. Show use permit number, or subdivision name and tract number (on title block of all sheets).
16. Affected utility companies shall be tabulated showing name of utility, address, phone number, and contact person.
17. Listing of owner's representatives to be contacted in the event of an "Emergency" and their 24-hour telephone numbers.
18. Adjacent sheet numbers shown. All sheets numbered consecutively.
19. Scale – Horizontal scale shall be 1" = 40' and vertical scale shall be 1" = 4'. The City Engineer shall approve other scales in writing, in advance.
20. General and special notes relating to construction methods.
21. All work within Highway 4, other State of California right-of-way is subject to Caltrans review and approval. Pacific Gas & Electric, Contra Costa Water District, East Bay Municipal District, East Contra Costa Irrigation District, East Bay Regional Park District or other agency's right-of-way's subject to their review and approval.

B. IMPROVEMENT PLAN CHECKLIST

1. Plan view of each street to be improved shall be shown on separate sheets indicating the disposition of existing improvements and contours/elevations within 100' of the project boundary, proposed improvements and future improvements. Proposed improvements shall include, but not be limited to, sidewalk, curb, gutter, driveways, sewer mains, water mains, water service and sewer lateral locations, storm drains, manholes, valves, fire hydrants, fencing, barricades, monuments, survey stationing, face of curb data for all curves, street lighting, traffic signs, pavement markings, and other data as required by the City Engineer. They survey

stationing shall read from left to right with the north arrow pointing either to the top or left edge of the sheet. All stationing shall be a continuation of existing improvements where possible.

2. Profile view of each street shall be shown immediately below or above its plan view. The profile shall include existing grade lines, sewer mains, storm drains, water mains, public utility mains, all utility crossings, and top of curb. Elevations shall be shown at top of curb, at grade break points, manhole and catch basin inverts, and water main crossings with other utilities, and at each lot line in plan view or every 100', whichever is less.
3. Street widening shall include cross-sections at 100' intervals together with existing and proposed cross-slopes, pavement sections, and pavement tie-in details.
4. Stationing to conform to existing street, stationing, and distances on Final Map.
5. Street widths and improvements must comply with any Master Plan and the Tentative Map.
6. All elevations, distances, and slopes must be mathematically correct.
7. Provide profiles of all cul-de-sac and curb returns, which must conform to City Standards. Curve data to be shown.
8. Dimension street and right-of-way widths in plan view on each sheet.
9. Show horizontal curve data for all sewer, storm drain, and water lines.
10. Grade breaks in excess of half a percent (0.5%) or more shall be constructed with vertical curves designed in conformance with Caltrans design standards. Show all vertical curve data.
11. Label pavement cross-slope on all typical sections and cross-sections. Show existing and proposed cross-slopes.
12. Show special erosion control measures in median islands, parkways where street grade exceeds seven percent.
13. Show saw cut lines in existing asphalt concrete at all pavement conforms.
14. Overlay existing pavement as necessary to provide smooth transitions.
15. Proposed design for the extension of streets 200' beyond property line (plan & profile) is demonstrated. For arterial and collector streets, show all existing and future driveways and median breaks.
16. Horizontal and vertical curves to conform to these Engineering Design Standards, local ordinance, State Highway Design Manual, and the requirements of the City Engineer.
17. Verify that streets intersect at right angles (+/- 5°).

18. A summary of quantities table shall be provide for the major civil improvement items relating, but not limited, to water, sewer, storm drainage, joint trench, street lighting, pavement quantities and others as required by the City Engineer.
19. Show the pavement design with note to verify after rough grading. Pavement design shall reflect T.I.s and 'R' values used in design. Any design to overlay existing pavement rather than place new pavement shall core the existing pavement to confirm existing pavement section and its adequacy.
20. Appropriate transition to be provided from widened sections, including berms, barricades and markers.
21. Label clearance dimensions between pipe crossings. Show minimum cover on underground facilities. Elevations of existing facilities to be verified by design drawings or potholing.
22. Pedestrian and handicap access ramps to conform to Title 24 California Code of Regulations requirements.
23. Verify corner sight distance requirements.
24. Monuments to be installed are shown per the Final Map locations.
25. Found street monuments shall be shown and protected or reestablished in conformance with the Land Surveyors Act.
26. Existing and proposed traffic signs and markings shall be shown on striping and signing sheets, dimension of all lane widths and layout of signs, legends, parking stall markings, etc.
27. Show mailbox locations on the signing & striping plan.
28. Show streetlights with stationing, and pole numbers.
29. Barricades shown where applicable.
30. Sewer lines, water lines, storm drain lines and joint trench extended to all subdivision boundaries and outside to roadway pavement.
31. Plans to show approved street names assigned by the Community Development Department.
32. Fire hydrant layout shown.
33. Compare with Final Map for street widths and easement locations.
34. Lot lines shown and stationed.
35. Sewer laterals and water services shown and stationed.

36. Compare with grading plan for consistency.
37. All proposed sound walls and retaining walls shall be shown on the improvement plans.
38. Adjacent improvement plans and subdivisions referenced.
39. Traffic signal design shown where required.
40. Provide detailed traffic control and construction staging plans when warranted.
41. Driveway widths and locations shall be shown and checked for adequate sight distance and conformance to grade requirements. Driveways on the opposite side of the street shall be shown, and also any street intersections or driveways within 100' of the property line.
42. Any deviations from City Standard Plans and Specifications shall be indicated on the plans and requires prior approval by the City Engineer.
43. Show any other information required by the Engineering Design Standards, local ordinance, or the City Engineer.
44. Detailed plans reflecting the design and construction of all public infrastructure improvements for street, sewer, water, fiber optics and storm drain, both on and off site, shall be in conformance with the adopted Infrastructure Master Plan and as directed by the City Engineer. Developer shall have written approval from the City Engineer for any variations from the City's Master Plan prior to any final map or plan approval.
45. Provide typical cross-sections for the boundary of the project, to depict the impact to the surrounding areas.
46. Provide designed water pressure for development (if pressure exceeds 80 psi, pressure reducing valves are required).

C. DRAINAGE IMPROVEMENT CHECKLIST

1. Stormwater Control Plan satisfying Provision C.3 of the City's Municipal Regional Stormwater Permit showing appropriate source control, site design, and green infrastructure in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects.
2. Master planned facilities designated as Contra Costa County Flood Control facilities shall be submitted to the Contra Costa County Flood Control District by the Applicant/Developer to be checked and approved.
3. Drainage area map (with the designated drainage area number) and hydrology calculations in the form of a report shall conform to Contra Costa County Flood Control District standards.

4. Gutter flow, inlet Q (flow) and bypass Q (flow) calculations to be submitted and values shown on plans.
5. Channel or pipe calculations, including entrance and exit conditions, hydraulic losses and velocity to be submitted.
6. HGL for 10 year storm shown on plans and shall be 1.25' below the flowline of the gutter.
7. Show storm drain pipe slopes. Storm drain grade shall be 0.2% and shall agree with approved hydraulic calculations.
8. Pipe size for publicly maintained lines shall be 18" or greater and shall conform to hydraulic calculations.
9. Label all proposed pipe materials and class of pipe.
10. Invert elevations and D-load requirements to be shown on improvement plans.
11. Change in pipe size allowed only at a structure. Match crowns of pipes.
12. Appropriate design consideration for grades of 20% or more.
13. Existing conditions at discharge points shall be adequately protected from damage due to erosion.
14. Inlets shall conform to the City of Brentwood standards and shall be adequately sized.
15. Desilting basins and/or energy dissipaters detailed and properly sized.
16. Crossings with any existing or proposed utilities shall be shown with adequate clearance or required encasement indicated.
17. No angles greater than 90° are allowed in storm drain systems without the permission of the City Engineer.
18. Hydrology studies shall include an analysis of historical agricultural drainage. Incorporate maintenance of those drainage patterns, including acceptance of and desilting of upstream agricultural runoff.

2. GENERAL NOTES

The following General Notes shall be included on all Public Improvement Plans and on site development plans (as warranted); however, additional notes may be required when applicable:

- A. An encroachment permit shall be obtained from the City of Brentwood for any work to be performed within the public right-of-way. (Note all other permit requirements from any other affected agencies.)

- B. Approval of these Public Improvement Plans as shown does not constitute approval of any construction outside the project boundary.
- C. The existence and location of existing underground facilities shown on these plans were obtained by a search of the available records. To the best of our knowledge, there are no other existing facilities except as shown on these plans. However, the Contractor is required to take precautionary measures to protect any existing facility whether or not it is shown hereon, and is responsible for correcting any damage to said utilities.
- D. Location and elevation of existing improvements shall be confirmed by field measurements prior to construction of new work. Prior to commencement of construction, the Contractor shall contact Underground Service Alert (1-800-227-2600) to obtain a U.S.A. identification number and to have existing utilities located. Contractor shall make exploratory excavations and locate existing underground facilities sufficiently ahead of construction to permit revisions to plans if revisions are necessary due to actual location of existing facilities.
- E. All work shall conform to the currently adopted editions of the Standard Plans and Specifications of the City of Brentwood unless otherwise noted.
- F. "City Engineer" shall mean the City Engineer or his/her authorized agent acting within the scope of his/her authority.
- G. The developer shall telephone the City of Brentwood Engineering Department, (925) 516-5420, at least two working days prior to starting construction work.
- H. The Contractor shall schedule a preconstruction conference at the job site with the City Engineer, developer, subcontractors, utilities, and other affected agencies at least two working days prior to starting any construction work. **The Contractor must have approved plans prior to scheduling a preconstruction meeting.**
- I. Traffic Control shall be provided in conformance with the latest edition of the "Manual of Uniform Traffic Control Devices (MUTCD)" issued by the State of California, Department of Transportation and as required by the City Engineer.
- J. If any cultural features or archaeological materials are uncovered during grading, trenching, or other excavation work, all work within 100' of these materials shall be stopped until a professional archaeologist certified by the Society of Professional Archaeology (SOPA) and/or the Society of California Archaeology (SCA) has had an opportunity to evaluate the significance of the find and appropriate mitigation measures are determined and implemented.
- K. Regular hours of work will be limited to 7:00 a.m. to 3:30 p.m., Monday through Friday. The owner or developer must submit a written request for approval by the City Engineer at least two working days in advance to work during any other hours, weekends, or holidays.

The following special hours of work will be enforced from Monday through Friday:

1. Work affecting traffic on Balfour Road, Brentwood Boulevard, Fairview Avenue, Lone Tree Way, Sand Creek Road, Central Boulevard or Walnut Boulevard will be limited to 9:00 a.m. to 3:00 p.m.
 2. Work adjacent to or within 1500' of any school while school is in session will be limited to 9:00 a.m. to 3:00 p.m.
 3. Work within 300' of occupied residential units and not affecting Balfour Road, Brentwood Boulevard, Fairview Avenue, Lone Tree Way or Walnut Boulevard, south of Balfour Road will be limited to 8:00 a.m. to 4:30 p.m.
 4. Work in excess of 300' from occupied residential units and not affecting Balfour Road, Brentwood Boulevard, Fairview Avenue, Lone Tree Way or Walnut Boulevard, south of Balfour Road, will be limited to 7:00 a.m. to 5:00 p.m.
 5. All Saturday work shall be restricted to 9:00 a.m. to 4:00 p.m.
- L. Contractor's operations shall conform to the rules and regulations of the State of California Construction Safety Orders pertaining to trenches and excavations.
- M. Contractor shall provide at least two working days advance notice to the City Engineer prior to connecting to existing water facilities. The manipulation of existing water valves shall be done by authorized City staff only.
- N. Contractor shall provide at least two working days advance notice to the City Engineer prior to the removal of any existing backflow preventers. Authorized City staff must be present at the time of removal to ensure procedures compliant with the California Division of Drinking Water are followed. The manipulation of existing water valves shall be under the direction of Public Works – Water Division staff.
- O. Photos of all exposed improvements including all connections to existing facilities shall be submitted to the City Engineer prior to placing backfill.
- P. The installation of erosion control facilities and measures is necessary at all times. (Erosion Control Plan shall be approved by the City Engineer).
- Q. Mailboxes shall be installed in locations approved by the local postmaster and per City of Brentwood Standard Plans and be shown on the signing and striping plans.
- R. All driveway locations and widths are approved based on the information provided by the developer/owner. If there is a required change in the floor plan, the developer/owner shall widen or relocate the driveway solely at his/her own cost.
- S. If driveway depressions are made in any curb, driveway approaches are then considered to be part of the Improvement Plan and shall be constructed in accordance with the City of Brentwood Standard Plans.
- T. Monuments are to be set as shown on the plans and per the requirements of the Subdivision Map Act, Land Surveyors Act, and the City Subdivision Ordinance and shall

be in accordance with the rules and procedures approved by the County Surveyor. All lot corners and tract boundaries shall be located and monumented in accordance with the recorded Tract Map and written certification shall be submitted to the City Engineer by the project civil engineer.

- U. Trees shall not be planted within the City of Brentwood right-of-way unless a permit has been obtained from the Engineering Department or if the trees are planted in accordance with a landscape plan approved by the City Engineer and the Parks & Recreation Director.
- V. Temporary steel plates that will remain within City of Brentwood right-of-way over 48 hours shall be recessed such that the steel plates are flush with the pavement.
- W. Joints between new pavement and existing pavement shall be made by saw-cutting existing pavement to create a neat butt joint and as depicted on the City Standard Plans. Feathering new asphalt paving over existing pavement is not allowed.
- X. The contractor shall notify the Contra Costa County Flood Control District and East Contra Costa Irrigation District prior to starting work near District's facilities and shall coordinate all work with District's representatives.
- Y. Location and height of all retaining walls shall be as shown on these plans. Retaining walls higher than four feet shall require a separate building permit.
- Z. It shall be the responsibility of the applicant/engineer to contact the various utility agencies, advise the agencies of the proposed improvements, and pay for the cost of relocations, if needed.
- AA. No final paving shall be done until existing power poles and other existing facilities, are relocated outside the areas to be paved.
- BB. Sub grade for all street, curb and gutter, and concrete flatwork shall be compacted to 95% relative compaction.
- CC. All underground utilities shall be constructed prior to the placement of baserock unless otherwise approved by the City Engineer.
- DD. All pavement markings in the public right-of-way shall be thermoplastic unless specifically called out as paint. No permanent markings shall be placed until the City Traffic Engineer, City Engineer or his representative approves cat tracking in the field.
- EE. Blue reflective pavement markers shall be installed at each fire hydrant location as shown on the City of Brentwood Standard Plans.
- FF. All traffic signs and street name signs shall be high reflective grade materials.
- GG. The improvement plans shall reflect that all on-site/off-site storm drain inlets shall be "No Dumping Drains To Creek" stenciled, using a two-step thermoplastic on the face of the curb adjacent to the inlet (see Standard Plans SD-15 thru SD-18). The project plans shall also include erosion control measures to prevent soil, dirt and debris from entering

the storm drain system, in accordance with the regulations outlined in the Association of Bay Area Governments (ABAG) Erosion and Sediment Control Handbook.

- HH. The City Engineer shall approve forms for curbs, gutters, and sidewalks prior to the placement of concrete.
- II. All storm drain structures shall be constructed to City of Brentwood Standards (with weep holes at subgrade elevation) unless otherwise noted.
- JJ. The Contractor shall review the current Storm Water Pollution Prevention Plan (SWPPP) provided by the owner. It is the Contractor's sole responsibility for conducting his/her operations in adherence to the SWPPP. The Contractor is responsible for any fines, delays, and/or damages resulting from any State Water Quality Control Board sanctions caused by the operation of the Contractor or his/her Subcontractors.
- KK. Benchmark used - (number, location, description and elevation).
- LL. Basis of bearings used - (description, bearing, and record reference).
- MM. Applicable City of Brentwood Standard Plans include but are not limited to, the following: (list Standard plans).

3. CHANGES IN THE WORK

Prior to commencing any construction not shown on the approved plans, the following actions shall be taken:

- A. The Engineer of Record shall submit electronically print showing the proposed change, along with a justification for the change.
- B. The proposed change will be reviewed by the City Engineer.
- C. Once the proposed change is accepted, the Engineer of Record shall submit a revised sheet of the original drawing, showing the proposed change, for final review and approval by the City Engineer. The City Engineer will approve the change by signing the plan revision in the space provided on the plans.
- D. All changes shall be clearly designated by "clouding" the plan revision in both plan and profile on each plan sheet and by labeling each change with a revision number and date of revision.
- E. After the revised original plan is approved by the City Engineer, one electronic copy shall be submitted to the City. No work on the proposed change shall commence prior to the submission of these items.

4. RECORD DRAWINGS ("AS-BUILTS")

Prior to the final acceptance of work by the City, the Engineer or Architect of Record shall:

- A. Provide written certification that improvements and/or grading have been substantially constructed in the locations and to the grades shown on the plans. Substantially shall mean + or – 0.1’.
- B. Submit an electronic copy of the redlined set of the original plans showing all "As-Built" information including approved construction changes, "As-Built" elevations, and final pavement sections. City staff will check the redlined and return them to the Engineer of Record for amendment of the original plans. The Engineer of record shall then submit an electronic copy showing and incorporating all the "As-Built" information. All "As-Built" information and changes shall be "clouded" and labeled. All plan sheets shall be clearly marked "RECORD DRAWING", dated, stamped and signed by the Record Engineer on each sheet.
- C. Provide a written statement by the project surveyor certifying that survey monuments have been set in accordance with the Final Map, and that the surveyor setting the monuments has been paid for the work. The developer's subdivision bonds will not be released until the "As-Built" required electronic (digital) files and surveyor's written statement have been submitted to the City.
- D. Provide written certification from other affected agencies and/or parties that all work to be accepted by other agencies has been accepted.
- E. Submit an electronic file of the improvements as required on the Submittal Procedures, Section 8, "Electronic File Submission."

5. PLAN REMOVAL AND ALTERATIONS

- A. All maps and plans, once approved, signed and made part of the public record, may be loaned by the Engineering Department to a representative of the Record Design professional or the City's bonded blueprint company.
- B. All proposed revisions to previously city-approved plans must be reviewed and approved in concept by the City Engineer prior to commencement of alterations on the original plans. One original electronic copy of the signed original plans must be provided to the City prior to revising the original plans. The Engineer of Record for the previously approved plans shall be the only party permitted to revise the original plans. Unauthorized revisions to plans borrowed from the City shall be removed.
- C. All loaned plan sheets or sets must be returned to the Engineering Department within two working days from the date borrowed.
- D. Plans and maps, which have been issued for any reason, become the responsibility of the engineering or land surveying firm originating the request until such time that the plans are returned to an Engineering Department Representative. The loss of or damage to any plans which are on loan shall result in the responsible party being fined the cost of replacement, including necessary engineering, by the City of Brentwood. No

revisions to the issued and damaged plans shall be approved or additional plans released to said responsible party until such time that the fine has been paid.

6. CHANGE IN ENGINEER OF RECORD OR ENGINEER OF WORK

Prior to any change in the Design Engineer status on a project, the previous Design Engineer, Engineer of Record, or Engineer of Work shall submit a release to the City of Brentwood and a statement that they have been paid in full. The City will not accept changing design professionals without this safeguard.

JOINT TRENCH PLAN REQUIREMENTS

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1. PLAN REQUIREMENTS

Joint Trench plans shall be drawn, printed, or otherwise reproduced in a manner guaranteeing a permanent record in black ink. The plans shall be prepared having an overall size of 24" x by 36". Every plan sheet shall be signed, with seal or stamp and expiration date, by the responsible design engineer. Submittals that are not signed and sealed will not be accepted for plan check.

A one-inch margin shall be left on each plan sheet edge, leaving an interior sheet size of 22" x 34". No writing or marking of any type shall be inserted within the one-inch margin. The border shall be black indelible line having a thickness of 1/16". All sheets shall be at the same scale and orientation. North shall be toward the top or left of the standard sheet.

Joint Trench Plans for public and private development projects shall be prepared in accordance with the Engineering Design Standards and submitted to the City Engineer for plan check and approval.

A. GENERAL INFORMATION

1. A Civil Engineer must sign and stamp all Joint Trench plans prior to City Engineer approval.
2. Submit a copy of the approved Tentative Map with the draft layout of the streetlight locations and the fiber optic trunk line and/or main line for approval. Once approved, utilize this layout for the design of the subsequent tract plans.
3. Include five-foot public utility easement (PUE). Verify with the Developer's Civil Engineer that the five-foot PUE is dedicated on the Final Map.
4. Smallest allowable scale is 1" = 40'. City reserves the right to request 1" = 20' if plan information is too congested and difficult to read.
5. Refer to the Improvement plan sheet requirement list for additional information.
6. At minimum, title sheet needs to show Tract Number, Developer's Name, Utility Contact Name and Numbers, Utility Company Job Numbers, Vicinity Map, Key Map, Sheet Index, General Notes, City Engineer Signature Block and Legend.
7. The following sheets must be included in the Joint Trench Plan Set: Composite, Streetlight, Fiber Optics, Gas and Electric Plans.
8. The Engineering Department will issue the street light numbers.

B. COMPOSITE PLANS

1. Storm drain line shall be on the opposite side of the street as the joint trench. Unless otherwise approved by the City Engineer, no joint trench is permitted parallel and adjacent to the storm drain on the same street side of the right-of-way.

2. Provide typical roadway cross-section depicting ROW, PUE, trench, and type of sidewalk (meandering or integral to curb and gutter).
3. Provide typical cross-section of joint trench.
4. All Joint Trench plans must include a detail depicting how the Joint Trench will cross over/under City Utilities (sewer, water and storm drain). Splitting the Joint Trench to cross-city utilities is prohibited.
5. If project includes already paved streets, add the following note: "All conduit crossings of {state Street Names} shall be installed by directional drilling or jack and bore method." Per current City of Brentwood Standards, ST-25b.
6. If new power poles must be constructed off-site to service the new development, submit written request to City Engineer for approval.
7. Provide a detail depicting the branching of the joint trench laterals within the 5' PUE and not within the private lots.
8. Label the Composite sheet numbers as: C1/#, C2/#, etc. (where # is the total number of sheets within the joint trench set).
9. Provide the following General Notes:
 - a. All PG&E, AT&T, Cable TV and Fiber Optic Boxes and Joint Trench Facilities are to maintain a minimum of 3' horizontal separation from sewer and water laterals and driveways.
 - b. All utility vaults, boxes, pedestals, etc. must maintain a 5' minimum clearance from fire hydrants and 3' minimum from streetlights.
10. If aboveground structures are required, provide a detail for acceptable screening devices. The City Engineer shall approve all locations for aboveground structures prior to plan approvals.
11. On the title sheet, with bold font, state the "**X LF of Joint Trench and Y Street Lights shall be installed with this Joint Trench Plan Set.**"

C. STREETLIGHT PLANS

1. Refer to Engineering Design Standards section (ED) of this manual for additional information.
2. The streetlight layout plan shall include the location of proposed lighting standards and its assigned pole numbers, electroliers, service point(s), pull boxes, the intensity of the proposed luminaire, a location plan of the conduit run showing wire size and length of proposed electrolier/pole assembly.

3. Include the following notes:
 - a. Upon tract acceptance, the streetlights shall be maintained by Lighting and Landscaping District No. {state LLD No.}.
 - b. Lights shall be energized per PG&E's rate schedule LS-2A (Owner owned and maintained).

4. Indicate the type of streetlight, Cobra or Decorative Style. For the legend use:



symbol to represent Cobra



symbol to represent Decorative

5. Streetlights should be placed on the property line or at the curb return on the long side of the house. Avoid installing streetlights at the curb return on the front side of the house.
6. The preliminary layouts of streetlights will be reviewed during the first plan check of the Improvement Plans; however, the Joint Trench Plans shall govern for the final location of streetlights.
7. Label the Streetlight sheet numbers as: SL1/#, SL2/#, etc. (where # is the total number of sheets within the joint trench set.)

D. FIBER OPTIC PLANS

1. Refer to the Engineering Design (ED) section of this manual for additional information.
2. Avoid utilizing the additional 5' public utility easement (PUE) for placement of vaults or pedestals. If space permits, install within the right-of-way.
3. If vaults are not placed on the property line, the boxes shall be located within the right-of-way and not within the 5' PUE.
4. Label the Fiber Optic sheet numbers as: FO1/#, FO2/#, etc. (where # is the total number of sheets within the joint trench set).
5. The developer shall depict the fiber optic conduit system in the joint trench composite plans and provide a separate fiber optic conduit plan for the review and approval by the City Engineer. Both plans shall be signed and stamped by a Civil Engineer registered in the State of California.
6. The Fiber Optic Plan shall include typical cross-sections of the streets, which shall include a 5' PUE beyond the right-of-way. Prior to inserting the PUE, the joint trench designer shall verify that this easement will be dedicated on the Final Map.
7. Show centerline stations within the streets.
8. Utilize the labels shown on the specifications for identifying the conduit and vault type and function. Provide lengths for all conduits.

9. Future stubs shall terminate into vaults. If providing stub conduits, provide stub and ultimate lengths.
10. Superimpose location of secondary electrical service box location within 200' of the Fiber Optic Node Vault (V_n). Future boring and/or trenching of streets is not allowed for future electrical service.
11. Include conduit design table on plan sheets (see sample on the Engineering Design section of this manual).
12. Include the following General Notes to the Fiber Optic Plans:

a. Conduit Material Specifications

	Quantity and Diameter Size	Material of Conduit
Fiber Optic Trunk Line (T) ^{1/}	2 – 4" ϕ	PVC Schedule 40
Fiber Optic Main Line (M) ^{2/}	1 – 4" ϕ	PVC Schedule 40
Coaxial Distribution (C) ^{3/}	2 – 2" ϕ	PVC Schedule 40 (color orange)
Services (S) ^{4/}	2 – 1-1/4" ϕ	PVC Schedule 40 (color orange)

^{1/} The "Fiber Optic Master Ring" carries all optical fibers throughout the trunk line system from the point(s) of connection to the node vaults (V_n).

^{2/} It carries all optical fibers from node vaults (V_n) to fiber optic splice boxes (V_f).

^{3/} It carries distribution cables from node vaults (V_n) to service vaults (V_s).

^{4/} It carries service drop cables from service vaults (V_s) to serviced residences.

b. Vault Material Specification

i. Vault for Fiber Optic Node (V_n)

- o Minimum size: 3' (W) x 5' (L) x 4' - 6" (D)
- o Type and material of box: concrete, AT&T – 3660 standard
- o Type and material of lid: Utility Vault or equal, H10 loading, torsion assist, adjustable frame style, penta head bolts, diamond, and painted black
- o Marking of lid: "City of Brentwood"
- o Conduit Entrance into Box: from the side
- o Maximum number of terminations: 12 (4 - 4" Φ , plus 4 - 2" Φ pairs)
- o Only the fiber optic trunk line (T), main line (F) and/or coaxial conduits (C) shall interconnect this node vault.
- o Add rigid cap for all empty conduits.

ii. Vault for Splices of Fiber Optic Main (V_f)

- o Minimum size: 30" (W) x 48" (L) x 34" (D)

- Type and material of box: reinforced concrete
 - Type and material of lid: reinforced concrete, single lid – type “D”
 - Marking of lid: "City of Brentwood"
 - Acceptable Manufacturer: Christy N48 Utility Box, or equal, with two extensions
 - Maximum number of terminations: 4 - 4" Φ
 - Conduit Entrance into Box: from the side
 - After installation of box and conduits, pour concrete sump.
 - Only the fiber optic trunk line (T) and/or main line (F) enters and exits this splice vault.
 - If the V_f vault is not on the property line, the box shall be installed within the right-of-way (ROW) and not within the five-foot (5') public utility easement (PUE).
 - Add rigid cap for all empty conduits.
- iii. Vault for Services (V_s)
- Minimum size: 24" (W) x 36" (L) x 34" (D).
 - Type and material of box: reinforced concrete.
 - Type and material of lid: reinforced concrete, single lid – type “D.”
 - Marking of lid: "City of Brentwood."
 - Acceptable Manufacturer: Christy N40 Utility Box, or equal, with two extensions.
 - Maximum number of terminations: 20 (4 - 2" Φ pairs, plus 6 - 1 1/4" Φ pairs).
 - Conduit entrance into box: from the side
 - Only the coaxial conduit (C) and services (S) shall interconnect at this service vault.
 - Maximum number of homes to serve: 6 (5 homes is not allowed).
 - If the V_s vault is not on the property line, the box shall be installed within the right-of-way and not within the five-foot (5') public utility easement (PUE).
 - Add rigid cap for all empty conduits.
- iv. Sweeps: Minimum radius is 24" horizontal or vertical.
- v. Installation
- A pull rope shall be installed in all conduits that are to receive future cables. A pull rope shall be nylon or polypropylene with a minimum tensile strength of 500 pounds. At least 2 feet of pull rope shall be doubled back into the conduit at each termination. Prior to acceptance by the City of Brentwood, all fiber optic and coaxial conduits shall be cleaned with a mandrel.
- vi. Terminations into Private Dwellings
- All communications, cable and fiber optic conduit shall terminate into one joint use panel, to be shared by all providers. (Contact Building Division for latest panel specification) Supply separate #10 copper ground wire from the UFER common building electrode to panel. A dedicated 20 amp circuit shall be located adjacent to the distribution hub and installed on the inside wall of the structure.

E. ELECTRICAL AND GAS PLANS (For reference only)

1. Electrical and Gas plans need to include with the Joint Trench Plan set.
2. Label the Electrical sheet numbers as: E1/#, E2/#, etc. (where # is the total number of sheets within the set of plans).
3. Label the Gas sheet numbers as: G1/#, G2/#, etc. (The number below shall indicate the entire # of sheets within the joint trench set.)

ENGINEERING DESIGN STANDARDS

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1. PURPOSE

The purpose of these Design Standards is to provide certain minimum standards for the design and construction of both publicly and privately maintained improvements within the City of Brentwood. Plans shall be designed to meet the minimum criteria and requirements established or referenced in these Engineering Design Standards. Any facilities or items which are not specifically included in these Standards shall be designed in accordance with the applicable requirements of the following publications, and the order of precedence of these documents shall be as listed. In case of a discrepancy between this document and any of the following documents, the more stringent requirement shall control:

- A. Subdivision Ordinance, Grading Ordinance, and Zoning Ordinance, and all other provisions of the City of Brentwood Municipal Code.
- B. Uniform Building Code
- C. State Highway Design Manual, latest edition
- D. State Planning Manual, latest edition
- E. Standard Plans and Specifications of the City of Brentwood, latest editions
- F. State Standard Plans and Specifications, latest editions
- G. Other Standards as required or specified by the City Engineer
- H. Conditions of Approval from Planning Commission or City Council.
- I. Manual on Uniform Traffic Control Devices (MUTCD)

Any proposed deviations from these Design Standards will be subject to the review and approval of the City Engineer.

2. GENERAL

Complete plans and specifications for all proposed improvements, including any necessary dedications and easements, shall be submitted to the Engineering Department for review and approval and must receive the required approval prior to the beginning of construction of any such improvements. This shall apply for both public and private improvements. Such plans shall be prepared under the direction of a Registered Civil Engineer in accordance with the provisions of "Civil Engineer's Act" Chapter 7 - Division 3 of the Business and Professions Code, relating to the practice of Civil Engineering.

Any proposed deviations from the City of Brentwood Standard Plans shall be called out in the submittals. The designer for any such changes shall obtain prior written approval from the City Engineer. If a set of improvement plans has been signed by the City Engineer, and changes to the City of Brentwood Standard Plans and Specifications have been made by the designer and have not been called out and approved in writing by the City Engineer, the developer will be held to meet the City of Brentwood Standard Plans and Specifications at no cost to the City of Brentwood.

3. RIGHT-OF-WAY POLICY

The City’s right-of-way policy requires that all public sewers, water mains, and storm drainage be in easements or rights-of-way granted or dedicated for sewers, mains, and storm drainage, and/or public use. In the case of public right of way for streets, further dedication is not necessary for public utilities.

Public facilities shall be designed and constructed within public street right-of-ways whenever possible. Public facilities within easements on private property are not encouraged, and will be reviewed on an individual basis by the City Engineer. Cul-de-sacs shall not be designed with public facilities in easements between properties at the end of the bulb.

Utility easements shall meet the more restrictive of the following width criteria:

- A. Minimum width of any easement shall be 15’ for one utility, with greater widths required for multiple utilities.
- B. All easements shall have a minimum width in feet equal to the required trench width according to the standard detail for trench backfill, plus two additional feet of width for every foot of depth of the pipe as measured from the bottom of the pipe to finished grade. All pipes shall be centered within their easements.

4. STREET DESIGN

A. GENERAL

For purposes of geometric and structural design, streets shall be classified according to the General Plan. Any deviation from the following standard shall require the approval of the City Engineer.

Table I: Street Design

Class	Right of Way (Feet)	Width Bet. Curbs (Feet)	Min. Traffic Index ^{1/}	Max. Grade Rate (%)	Min. Centerline R for Hor. Curve (Feet) ^{2/}	Min. AC3/	Min. Base AB	Min. Comp. AC and AB
Arterial Street	100-140	80	9.0	8	1200	5"	14"	95%
Collector Street	76-96	56	9.0	10	800	5"	14"	95%
Major Residential Collector	70	40	7.0	10	600	4"	10"	95%
Minor Residential Collector	60	40	6.5	15	250	4"	8"	95%
Industrial/Commercial	64	44	6.5	8	250	4"	10"	95%
Residential Local ^{4/}	56	36	5.0	15	250	4"	8"	95%
Private Streets/Parking Lots ^{5/}	Varies	Varies	5.0	15	250	4"	6"	95%

^{1/} May be raised at the discretion of the City Engineer if traffic warrants a higher value. Traffic routes will require a higher Traffic Index (TI) as approved by the City Engineer

^{2/} Actual design of horizontal curves shall be based on the design speed of the street and approved by the City Engineer.

^{3/} To be installed in at least two lifts.

^{4/} Local streets and cul-de-sacs less than 250' in length.

^{5/} Parking lot aisles subject to truck traffic shall be designed to industrial/commercial standards.

Street sections shall be calculated based on "R" values obtained from material gathered from the level of the proposed subgrade using the State of California Division of Highways design method. If subgrade has an "R" value of 10 or less, geotextile fabric shall be installed on subgrade prior to placement of AB material. No structural allowance will be made for the geotextile fabric. The minimum street section shall not be less than four inches (4") of asphalt concrete and eight inches (8") of aggregate base. Aggregate base and sub base shall conform to the State Standard Specifications, Sections 25 and 26. The use of "Sierracrete" manufactured by Dupont is not permitted.

Private streets, parking lots, and commercial developments shall use local residential requirements as a minimum. Off-street parking shall be provided, designed, and constructed in accordance with the requirements of local ordinance and as required by the City Engineer.

B. GEOMETRICS AND LAYOUT

1. Street centerlines shall intersect at right angles with a variance of plus or minus five (+/-5) degrees. A minimum of 200' shall be maintained between street centerline intersections. Whenever possible, streets must line up with opposite streets. Variances from this standard must be secured in advance, and in writing, from the City Engineer.
2. Curb line radii shall be tabulated on the construction plans. Numbering shall not repeat from sheet to sheet.
3. Curb return radii:

The minimum face of curb radius at street intersections is determined based on the class of the intersecting streets as follows:

Table II: Curb Return Radii

<i>Class</i>	<i>Min. Curb Return Radius (feet)</i>
Arterial Street to Arterial Street	50
Arterial Street to Any Collector Street	40
Any Collector Street to Any Collector Street	30
Any Collector Street to Residential Local	30
Residential Local to Residential Local	25
Industrial/Commercial to Any Street	35

4. Gutter flow line grades shall have a minimum slope of 0.01 feet per foot on all cul-de-sacs and 0.006 feet per foot at all other locations and maximum depicted on Table I of this section, "Street Deign."
5. Cross slope on all streets shall be as shown on the Standard Plans unless a deviation has been approved by the City Engineer.
6. The minimum vertical curve length allowable at the intersection of two grades shall be 50'. Actual design of the vertical curve shall be based on the design speed of the street and stopping sight distance as determined by the City Engineer.

However, vertical curves may be omitted where the algebraic difference in grades is less than one-half percent (0.5%), and will not be visible to the driving public.

7. The minimum stopping sight distance over any segment of the roadway on residential, collector or arterial streets shall conform to the Highway Design Manual.
8. Perimeter streets shall be a minimum of one-half the roadway width plus a 12' travel lane.
9. Minimum longitudinal grades are 0.006 feet per foot (0.6%) on all asphalt concrete. Normal crown is 2% on all streets. Offset crowns on cul-de-sacs are not allowed.
10. Provide special pavement design where grades are 12% or greater.
11. Tangent sections are required at all street intersections and between reverse horizontal curves.
12. Maximum length of cul-de-sacs is 600'.
13. Subdivision roadway design
 - a. No more than 25 residential lots shall have access from an individual cul-de-sac
 - b. New single-family lots shall be arranged such that no more than 25 lots are developed with access from a single public roadway. Additional lots will require additional connections to a public roadway to the satisfaction of the City Engineer and Contra Costa Fire District.
 - c. Roadways shall be designed in compliance with City standards and Contra Costa Fire District Requirements.

C. APPURTENANCES

1. Driveways
 - a. Driveway shall not be permitted within five feet of a property line on multi-family property and commercial property. Driveway locations for single family properties shall not be permitted within five feet of a property line unless a property fronts on a cul-de-sac bulb. Special consideration by the City Engineer may be given to major and minor street driveway configurations of an unusual nature.
 - b. Commercial/industrial and multi-family driveways shall have a minimum width of 36' and a maximum width of 42'. Commercial driveways shall have a minimum radius return of 25'. The minimum width for a single-family residential driveway shall be 12' with a maximum of 30'. Transitions at each side of the driveway shall be three feet
 - c. When adjacent to a street intersection, commercial/industrial driveways shall have a minimum of 65' from the curb return to the centerline of the driveway or as approved by the City Engineer.
 - d. The minimum distance between commercial driveways shall not be less than 20' as measured at the face of curb, including transitions.

- e. All driveways shall conform to the City of Brentwood Standard Plans.
- f. Residential driveways shall be of the same width as the garage doors, not more than 40% of the lot frontage of any parcel shall be devoted to driveways and a minimum of 20' of clear distance per lot frontage is required for on-street parking. Lots fronting on a cul-de-sac and knuckles are exempt from this requirement.

2. Parking

Parking requirements shall be considered on a street-by-street basis. The aggregate number of provided on-street parking spaces will be considered within the limits of each individual street or cul-de-sac.

For single-family lots, a minimum of one on street parking space (25' clear distance) is required. For lots which front on a cul-de-sac bulb, one on-street parking space, 18' in length, shall be provided.

On-site parking and all parking lots shall be designed and provided as required by the Zoning Ordinance and the City Engineer.

3. Valley Gutters

Valley gutters will not be allowed within the public right-of-way or public easement.

4. Sidewalks, Curbs and Gutters

- a. Sidewalks shall be a minimum of five feet wide as measured from face of curb. The City Engineer may require wider and/or separated sidewalks.
- b. Sidewalk, curb and gutter shall be of the design as shown on the Standard Plans or as required by the City Engineer.
- c. Curb ramps for the handicapped (Handicap Ramps) shall be installed at all street crossings and curb returns and shall be constructed in conformance with Section 39-7, "Miscellaneous" (Asphalt Concrete), Section 73, "Concrete Curbs and Sidewalks," of the State Specifications, the most current edition of the State Standard Plans, and in conformance with the Americans with Disabilities Act.

5. Survey Monuments

Survey monuments shall be provided as shown on the Final Map and shall be installed as a minimum at the following locations:

- a. On the roadway centerline at all intersections.
- b. At beginning and end of each horizontal curve on the centerline.
- c. On the roadway centerline at the end of any stub street or cul-de-sac.
- d. At all other locations as required by the City Engineer.
- e. A minimum of two monuments shall be installed in all subdivisions, with coordinates on the California Coordinate System (NAD 83), 1990 Adjustment, or current adjustment as directed by the City Engineer.

- f. Extensions of lot lines shall be tagged and marked in accordance with Board of Registration of Civil Engineers and Licensed Surveyors Policy Resolution No. 96-04.
- g. All monuments set shall be as shown on the Standard Plans and shall clearly show the registration number of the licensed Civil Engineer or Land Surveyor who prepared the Final or Parcel Map.
- h. For street reconstruction and overlay projects, existing monuments shall be referenced by a registered land surveyor prior to the start of construction, and recovered and/or replaced at the conclusion of the work. The surveyor shall file corner records required by statute with the County.

6. Signing, Pavement Markings, and Barricades

- a. Street names shall require approval by the Planning Division, Police Department and the Fire District.
- b. Street name signs, stop signs, and pavement markings shall be paid for and installed by the developer or subdivider.
- c. All pavement markings in the public right-of-way shall be thermoplastic unless specifically called out as paint.
- d. All private pavement markings shall be thermoplastic or two coats of traffic paint with reflective glass beads incorporated into each coat.
- e. Other regulatory and warning signs to control traffic, such as speed zone signs, are to be installed by the developer or subdivider.
- f. Permanent barricades shall be installed where improvements cover only a portion of the ultimate development or as directed by the City Engineer. The barricade shall be constructed, erected, painted and signed in accordance with the Standard Plans.
- g. Signs and pavement markings shall be in accordance with the MUTCD and Caltrans Standard Plans.
- h. Thermoplastic stencils stating "No Dumping-Drains to Creek" shall be installed at each catch basin.

7. Easements

Public service, drainage, landscaping, and fence easements shall be located as required by the utility companies and the City Engineer. Publicly maintained facilities within easements on private property are subject to the review and approval of the City Engineer.

8. Existing Roadways

All new underground facilities crossing existing arterial or collector streets shall be by boring or jacking, unless otherwise approved by the City Engineer.

9. Underground Utilities

Sufficient information shall be shown to establish the elevation and/or profile of water services and sewer laterals at crossings with other underground utilities (storm drain, joint trench, etc.). The plans shall ensure that minimum clearances at pipe crossings are maintained. Minimum clearance is one foot between any water main/service and other facilities. Minimum clearance between all other

underground pipes and facilities is six inches. Services and laterals shall cross above or below the conduit bank in joint trenches.

D. TRAFFIC CALMING

1. Phase I - Enforcement and Design

- a. Conduct a Speed Survey- the Police Department will work in conjunction with the Engineering Department to conduct a speed survey to determine the extent of the speed or volume problem and if traffic enforcement can be applied during specific time periods. This will be based on reasonable number of violators exceeding the 85th percentile speed during those identified peak volume time periods.
- b. Traffic Enforcement- If identified time periods and reasonable number of vehicles exceeds the 85th percentile speed, as determined by the Police Department or Engineering Department, then enforcement steps shall be taken. A speed survey will be re-conducted if problem is continuing.
- c. Establish and Post Appropriate Signage- the Engineering Department will consider the placement of signs. The signs would typically indicate the speed limit and could include pavement legends.
- d. Stop Signs- The Engineering Department can perform a stop sign analysis based on stop sign placement criteria

2. Phase II - Traffic Calming Devices

If Phase 1 does not resolve the resident's complaints then the City may consider the following traffic calming devices in the following order. All of these devices would require 67% majority approval by the residents of the affected street before implementation occurs.

- a. Painted Lines- The City may consider the placement of traffic stripes such as centerlines, right edge-lines or bicycle lanes. These options tend to help decrease speeds due to visual narrowing of the street.
- b. Turn restrictions- Directions signage restricting certain turning movements can be considered and installed.

3. Phase III- Physical Road Structures

The installation of this feature requires 67% majority approval by the affected residents through a mail ballot and will only be considered if Phase II did not resolve resident complaints.

- a. Elongated Speed Bumps – The City may consider the placement of elongated speed Bumps, provided the criteria set have been met. Refer to the "Speed Bump Criteria" in Appendix AP-N of this manual for the guidelines.

E. CRITERIA FOR INSTALLATION OF MULTI-WAY STOP SIGNS

The criteria for installation of multi-way stop signs are intended for analysis purposes. Meeting these criteria may warrant consideration for installation of multi-way stop signs.

However, do not automatically assume that multi-way stop signs will be installed if these criteria are met. Professional discretion will be utilized by staff when making the final decisions. For example, a stop sign may not be approved, despite meeting these criteria, if it will cause more harm than benefit.

Temporary stop signs may be installed, if approved by the City Engineer, for construction or emergency needs without meeting these criteria.

1. High-Volume Streets (over 4,000 cars per day)

- a. Multi-way stop sign installation may be considered if any two of the following conditions exist:

Minimum Traffic Volumes:

- i. The total vehicular volume entering the intersection from all approaches must average at least 450 vehicles per hour for any 8 consecutive hours of an average day, and
- ii. The combined vehicular and pedestrian volume entering the intersection from the minor street must average at least 150 units per hour for the same 8 consecutive hours, but
- iii. When the 85th percentile approach speed exceeds 40 mph, the minimum volume requirements are 70% of the above standards

- b. Accidents: An accident problem, as indicated by four or more reported accidents within a 12-month period of a type susceptible to correction by a multi-way stop installation.
- c. Visibility: The stopping sight distance on the approaches to the major street are less than recommended for the given design speed. The design speed shall be considered to be the posted speed plus 10 mph.

2. Moderate-Volume Streets (4,000 or fewer cars per day)

- a. Multi-way stop sign installation may be considered if any two of the following conditions exist:

Minimum Traffic Volumes:

- i. The total vehicular volume entering the intersection from all approaches must average 300 vehicles per hour for any 8 hours of an average day, and
- ii. The vehicular and pedestrian volume entering the intersection from the minor street for the same 8 hours must average at least 100 cars per hour, but
- iii. When all of the following conditions are met, the volume requirements are 60% of the above standards.
 - a. Both streets have residential frontage with existing 25 mph speed limits; and
 - b. Neither street exceeds 40 feet of roadway width; and
 - c. No existing stop sign or signal is located on the more heavily traveled street within a distance of 800 feet; and
 - d. Intersecting streets extend 800 feet or more away from the intersection; and

- e. Intersection is a location where large numbers of elementary school children cross (minimum of 25 children crossing on an average school day)
3. Accidents: An accident problem, as indicated by four or more reported accidents within a 12-month period of a type susceptible to correction by a multi-way stop installation.
4. Visibility: The straight-line sight distance on the approaches to the major street for vehicles or pedestrians crossing the intersection is less than 250 feet.
5. Speed: The 85th percentile vehicle speed must exceed 30 miles per hour on the approaches to the intersection.

5. STORM DRAINAGE

A. GENERAL

All design shall be in conformance with the current Contra Costa County Flood Control District Master Plan.

These standards are intended to insure that watercourse and surface water laws are complied with and that runoff from storms up to the 100-year return frequency are conveyed through storm facilities and disposed of in a manner, which protects public and private improvements from flood hazards.

The diversion of natural drainage will be allowed only within the limits of a proposed improvement. All natural drainage must leave the improved area at its original horizontal and vertical alignment unless a special agreement, approved by the City Engineer, has been executed with adjoining property owners. Additional drainage runoff resulting from the improved area shall not be allowed to drain onto, or cause ponding on, adjacent properties. Existing drainage patterns on adjacent properties shall be maintained.

All storm drainage facilities shall include provisions for ultimate future upstream development and no development shall discharge at a rate, which exceeds the capacity of any portion of the existing downstream system. Calculations for storm drain design within a development as well as calculations for runoff generated by upstream areas within the contributing watershed shall be submitted to the City Engineer for approval. These calculations are to be based upon the ultimate watershed development and shall include:

1. Topographic Map showing the relationship between the proposed development and the remainder of the watershed, including acreages of all sub-areas.
2. Map of the proposed development indicating:
 - a. All applicable existing and proposed improvements.
 - b. Runoff coefficients for all areas where runoff was calculated.
 - c. Time of concentration and intensity of rainfall at each hydraulic structure.

- d. The magnitude and direction (indicated by arrow) of flow in each pipe and flow to each structure contributed by its tributary area. All flow rates shall be in cubic feet per second (CFS).
 - e. Elevation of pipe inverts at structures and the top of structure elevation at each structure.
 - f. Sizes and slopes of all stormwater conveyance structures and conduits.
 - g. The 10-year HGL with elevations at all junction structures, manholes and catch basins.
 - h. Contra Costa County Flood Control Drainage Area Number.
3. Tabulation sheet (Hydrology/Hydraulics Report), which includes all of the above information and summarizes the design in a clear, concise, professional format.
 4. Construction drawings shall include:
 - a. 10-year storm water surface elevation to be called out on profile view at each structure.
 - b. All flow rates in cubic-feet-per-second called out on profile view for each conduit.

All proposed improvements shall be designed such that, the minimum hydraulic grade line or water surface shall be 1.25 feet below the gutter flow line or when applicable, as required by the Federal Emergency Management Agency (FEMA) and the Department of Water Resources (DWR) Division of Safety of Dams, whichever is greater.

Containment of floodwaters within the public right-of-way is required at all times. Flood waters shall be confined to streets or other approved right-of-ways by grading, levees or alternative means acceptable to the City Engineer. In no instance shall an improvement be designed such that floodwaters can reach a depth of 0.50 feet, as measured from the top of curb, before overland release occurs. The design of all bridges, box culverts, levees, detention basins, spillways, and other applicable structures shall comply with the latest FEMA and DWR Division of Safety of Dams regulations.

At intersections of pipes, the downstream pipe shall have a crown elevation, which is equal to the crowns of all upstream connecting pipes. Pipe diameters shall not decrease in the downstream direction.

B. DESIGN

All storm drain design criteria, unless otherwise stated herein or directed by the City Engineer, shall be in accordance with the Contra Costa County Standard Specifications for Public Works Construction.

1. Easements

Publicly maintained drainage conduits and channels on private property are subject to the approval of the City Engineer and will not be allowed unless they lie within a dedicated public easement. Where minor improvement of a drainage channel falls on adjacent property (such as day lighting a ditch profile) written

permission from the adjacent property owner(s) for such construction shall be required. A copy of the document which grants said approval shall be submitted to the City Engineer prior to the approval of the improvement plans.

Easements for closed conduits shall meet the more restrictive of the following width criteria:

- a. Minimum width of any easement for a closed conduit shall be 15'.
- b. All easements for closed conduits shall have a minimum width in feet equal to the required trench width according to the standard detail for trench backfill plus two additional feet of width for every foot of depth of the pipe as measured from the bottom of the pipe to finished grade. All conduits shall be centered within their easements. Drainage easements for open channels shall have sufficient width to contain the open channel and two 17' wide service roads. The toe of a bank shall not be within 17' of an easement boundary. Easement boundary lines shall, at changes of alignment, have a 50' radius sufficient to provide turning room for vehicles operating on the service road.

2. Pipe and Appurtenances

The minimum allowable inside diameter of any publicly maintained system and storm drain pipe in private streets shall be 18" and designed to flow with a minimum velocity of two feet per second when flowing full. The pipe materials, which may be used for storm drainage improvements within the City and right-of-way and easements, are specified in Sections 64, 65 and 66 of the Caltrans Standard Specifications and the corresponding sections of the Contra Costa County Standard Specifications. Under no circumstances shall storm drain (top of bell) encroach into aggregate base material. Cover less than two feet requires concrete cap and City Engineer's approval. CMP, CAP, PVC, and ABS will not be allowed.

For publicly maintained pipes the minimum pipe slope for any storm drainpipe shall be 0.25%. Minimum depth shall be two feet below street subgrade. Maximum manhole spacing shall be 300'. The City Engineer shall approve any deviation from these minimum allowable criteria.

The City Engineer may allow the use of smaller diameter pipe, and alternate pipe materials and structure design, for privately maintained storm drain systems. In all cases, the private storm drain system shall be designed to comply in all other aspects with the design criteria established in these Design Standards. Pump Station/Lift Stations - no pumping of storm flows is permitted, unless approved by the City Engineer. In order to qualify for approval, pump stations must be part of the City's Master Plan or maintained by a privately funded source on a permanent basis.

3. C.3 Requirements

- a. The project shall meet all relevant C3 requirements of the current NPDES Permit held by the City. In addition, the project shall adhere to standards and recommendations found in the Contra Costa County Clean Water Program

Guidebook. No grassy swales or C.3 facilities shall be constructed within the public right-of-way or internal residential street. All improvements shall be to the satisfaction of the City Engineer.

- b. The applicant shall develop an Operation and Maintenance Manual for C.3 facilities. The Operation and Maintenance Manual shall address all aspects of the maintenance, including but not limited to; sediment removal, weed and trash abatement, an inlet and outlet structures. The Operation and Maintenance Manual must be reviewed and approved by the City Engineer prior to approval of the improvement plans.

6. SANITARY SEWERS

A. GENERAL

The City Engineer retains the right to require additional upgrading and sizing on all plans in accordance with the most recent Master Plan. The City Engineer must approve any deviation from the City's Master Plan in writing.

1. Sanitary sewer system design within a developing area must include provisions for size and capacity to adequately convey all domestic and industrial waste that can be reasonably anticipated under conditions of full ultimate development. Engineering calculations to support the sewer system design shall be submitted to the City Engineer for approval. The calculations shall include:
 - a. Map indicating service area within the sewer system including any future contributing development with projected land use, zoning, and any physical features contributing to the sewer system design.
 - b. Sanitary sewer waste volumes (design capacity, full pipe capacity, design flow, cleansing velocity), both existing and proposed, within the service area of the system.
 - c. Size and slope of each pipe between appurtenant structures.
 - d. Invert/RIM elevations of each pipe and appurtenant structure.
2. Line Size, Service Policy, and Easements
 - a. The line size and service policy requires that the minimum size of any new public sewer shall be eight inches in diameter.
 - b. All side sewers (laterals) eight inches and larger, or any lateral connection to a main trunk line 18" or larger, shall be connected by or at a manhole.
 - c. The minimum lateral size is four inches with the lateral's intended use to serve single-family residences. Six inch or larger laterals shall be installed where intended use is industrial, commercial or greater than single-family residential flows. Joint use of laterals will not be permitted except in multi-family residential uses, or as approved by the City Engineer.
 - d. Publicly maintained sewer lines on private property are subject to the approval of the City Engineer and will not be allowed unless they lie within a dedicated public easement.
 - e. Sewers serving two or more residential units or two or more properties or businesses shall be public from five feet outside the building line downstream, or as approved by the City Engineer.

B. DESIGN

1. Flow

The design sanitary sewer flow shall be computed using the following formula:

$$QD = QP + I$$

Where: QD = design flow (gallons per day)
QP = peak flow
I = Infiltration

The peak flow (QP) for residential service areas is defined as three times the average flow, with the average flow for the service area being computed from two basic assumptions:

- a. Three persons per single-family dwelling.
- b. One hundred (100) gallons per person per day.

Acreage flow estimates for other than residential service areas are as follows:

	Average Flow (Gal./Acre/Day)	Peak Flow (Gal./Acre/Day)
Commercial Areas	1600	4000
Business Park/Office	2000	4000
Schools	2000	4000
Light Industrial Areas	2500	4000
Heavy Industrial Areas	Sewage flow rate shall be considered on a case-by-case basis and may require special design.	

Infiltration and inflow (I & I) shall be computed by using 500 gallons per inch-diameter-mile per day for sewer mains and laterals. Residential laterals shall be assumed to be a minimum of 75 feet in length.

2. Location

All sewer pipelines designed for the main or trunk lines of sewer collection shall be constructed and installed within the right-of-way of public streets or roads, unless such construction or installation is determined to be impractical by the City Engineer. Minimum of 20-ft wide Public Utility Easement or Sewer Easement is required for sewer pipelines outside of public right-of-ways.

The location of the sewer main in any street shall be a minimum of six feet from the centerline of the street on the southerly or westerly side of the street. Sewer mains shall be located such that 10' clear horizontal distance is provided to adjacent water lines.

3. Pipe Capacity

- a. Manning's Formula $[Q = A (1.49/n) R^{2/3} S^{1/2}]$ shall be used to determine pipe capacity. The "n" value shall be 0.013 or the pipe manufacturer's recommendation, whichever is greater.
 - o All main sewers shall be sized to carry the design flow at capacities of 50% for pipes up to 12" in diameter and 75% for pipes 12" and greater in diameter.
 - o Design capacities for trunk sewers 12" and larger shall require approval by the City Engineer.

4. Velocity

Sewer velocity shall be equal to or greater than two feet per second for all sewers when flowing at design capacity. Where design velocities for main sewers exceed 10 feet per second, polyethylene lined ductile iron pipe conforming to the requirements of ANSI/AWWA C151/A2.51 and shall have a minimum 35 mil polyethylene lining in conformance with ASTM Designation D1248. Class of pipe shall be as required for design loads. All ductile iron pipes shall be wrapped with an 8-mil polyethylene blanket.

5. Pipe Cover and Clearances

- a. Minimum pipe cover and clearance shall be maintained in the design of sanitary sewers. If conditions exist which make it impractical to meet the minimum cover and clearance requirements, the conditions and locations shall be specifically noted above the sewer profile on the plans. Each location not meeting the minimum cover and clearance requirements will require special approval. Any planned condition being specially approved with less than minimum cover will require special pipe, casing, bedding, and/or backfill as directed by the City Engineer. Other utilities shall not, under any circumstances, be installed directly over and parallel to any sanitary sewer line installation.
- b. Main and trunk sewers shall have a minimum depth of five feet as measured from the top of the pipe to the street subgrade.
- c. Laterals shall have a minimum depth of five feet from the top of the pipe to the finish grade where they connect to the main.
- d. Pipe shall be laid with a minimum of 12" vertical clearance from water lines and six inches vertical clearance from all other improvements and utilities, unless otherwise approved by the City Engineer.

6. Horizontal and Vertical Curves

- a. Except for frontage roads, the centerline of sewer mains and trunks shall be located a minimum of six feet off centerline to the south or west side of the street. Sewer mains shall be located such that 10' clear horizontal distance is provided to adjacent water main and service lines.
- b. Sanitary sewer mains shall be on a straight line between manholes. Whenever it is essential that a horizontal curved alignment be used, a minimum radius of 200' shall be required, but shall be greater whenever possible. The radius and delta of all curves shall be indicated on the plans

adjacent to the curve. Sewer manholes must be located at either the B.C. or E.C. of all curves.

- c. The deflection in the joint between any two successive pipe sections shall not exceed 80% of the maximum deflection as recommended in writing by the pipe manufacturer. Minimum 2-foot pipe lengths may be used to install short radius curves providing the requirements specified herein are met and approved by the City Engineer.

7. Lateral Sewers

Laterals are those portions of the sewer system between the sewer main and the portions of the sewer maintained by the property owner. The usual location of the line of responsibility is the sidewalk cleanout. In all cases, City maintained sewer lines would lie in a street right of way or dedicated public easement. In all new subdivision work, the house lateral line from the sewer to the property line shall be installed at the time the sewer main is constructed. Whenever a sanitary sewer is installed which will serve existing houses or other buildings, a lateral line shall be constructed for each existing individual house or building. Each lateral line shall be referenced to the improvement plan stationing. A separate lateral to the sewer main shall service each individual on-site building.

- a. All laterals, from property line or edge of easement to the point of connection with the main line or a manhole shall have an alignment that provides an angle of intersection with the downstream section of the main sewer of no less than 90°.
- b. The maximum deflection at any one point in a lateral, not including fittings at saddle or wye connection to main sewer or at angle points having clean outs, shall be 22½° (1/16 bend) and any two consecutive deflections (bends) shall not be less than two feet apart.
- c. Cleanouts shall be provided on the lateral sewer within the City right-of-way at the back of sidewalk as shown on the Standard Plans.
- d. Laterals connecting houses having a finished floor elevation twelve 12" or less above the highest rim elevation of the nearest upstream structure shall require installation of a backflow prevention device next to the cleanout at the house.
- e. Sewer lines being built in streets shall incorporate the installation of wyes and laterals to all adjoining properties.

8. Appurtenances

- a. Manholes – All manholes shall be located in the center of the travel lanes. Normal maximum spacing for manholes shall be 4300'. Where intersecting lines determine the location of two manholes, the distances between intervening manholes shall be approximately equal. Sewers on curved alignment with a radius of less than 400' shall have manholes spaced at a maximum 300' on the B.C. or E.C. of the curve or adjusted to fit the individual case.

The spacing of manholes on trunk sewer lines 10" and larger in diameter shall be proposed for each individual case and shall be approved by the City Engineer.

Whenever, at manholes, a change in the size of pipe, or an angle of 20° or more in alignment occurs, the flow line of the incoming pipe shall be a minimum of 0.10 feet above the flow line of the outgoing pipe, or an amount necessary to match inside pipe crowns. The plans shall show invert in and invert out of the proposed manhole. Manholes shall be used at the termination of all sewer mains including cul-de-sacs. Laterals shall be connected to this manhole for services to adjacent properties within the cul-de-sac.

- b. Drop manholes will not be allowed. The maximum shelf height above crown of the outlet pipe shall be one foot. The invert of any inlet pipe shall not be higher than the top of the shelf.
- c. Manholes shall be installed at the upstream end of mains (proposed to be extended in the future and stubbed out as approved by the City Engineer).
- d. Pump Station/Lift Stations - no pumping of sanitary flows is permitted, unless approved by the City Engineer. In order to qualify for approval, pump stations must be part of the City's Master Plan or maintained by a privately funded source on a permanent basis.

9. Unusual Design

Special design of unusual features or structures requires individual study and approval by the City Engineer. Force mains will not be allowed.

10. Allowable Pipe Materials

Only vitrified clay, PVC SDR 26, and ductile iron pipe with protecto 401 lining will be allowed. Refer to Section 120, "Sewer Facilities," of the Standard Plans and Specifications for further material specifications.

7. POTABLE WATER SYSTEM

A. GENERAL

1. Potable Water system design within a development area shall conform to the City of Brentwood General Plan and current Water Master Plan. The City Engineer shall approve any deviation from the City's Master Plan in writing. All systems serving more than 25 units shall have two points of connections to the public system. The City Engineer retains the right to require additional upgrading and sizing on all plans in accordance with the most recent Water Master Plan or as required assuring adequate fire flow and a reliable secure system. All improvements including extensions, replacements, and repairs shall conform to the requirements of the, National Board of Fire Underwriters, American Water Works Association Standards, State of California Division of Drinking Water Regulations, and the Standard Plans and Specifications of the City of Brentwood.
2. The existing City of Brentwood potable water system supplies treated water within the developed area of the City. Brentwood uses a reservoir gravity network to pressurize its distribution system.

3. All City-owned potable water system facilities shall be installed only in public streets, or rights-of-way. Public water facilities within dedicated easements on private property are discouraged, and require the approval of the City Engineer. A single service connection shall not serve more than one premise except in multi-family dwellings. Separate premises under a single ownership, control or management shall be supplied water through separate service connections. More than one property shall not be connected to a single service for the purpose of avoiding water connection charges.

Reference is also made to Title 17, Chapter V, Sections 7583-7622 inclusive of the California Administrative Code, regulating cross connections between drinking water systems and other sources of water. All construction shall be in strict compliance with said regulations and State of California Division of Drinking Water Regulations. Booster pump stations are only permitted in special circumstances and then only with prior written authorization by the City Engineer.

B. DESIGN

1. Layout of Mains

The distribution system, whenever possible, shall employ the "Gridiron System" of water circulation so as to allow pressure equalization. All water pipelines designed for the transmission or distribution of domestic water supply shall be constructed and installed within the right-of-way of public streets or roads, unless such construction or installation is determined to be impractical by the City Engineer.

Water lines and services are not allowed to cross under sanitary lines unless suitable separations between said facilities and/or appropriate protective casings have been provided in accordance with all applicable water regulations, as approved by the City Engineer.

The location of the water main in any street shall be a minimum of six feet from the centerline of the street on the northerly or easterly side of the street. Water mains shall be located such that 10' clear horizontal distance is provided to adjacent sewer lines.

The applicant shall show, on the profile of improvement plans, inverts of pipe at all changes in grade in all areas where conflicts with other utilities might arise, the top of pipe and appurtenances shall also be shown. A detail shall be drawn of such conflicts with sufficient information shown that the City Engineer can make a determination as to the adequacy of the solution shown.

2. Sizes

In general, the minimum size publicly maintained water main shall be eight inches in diameter. The installation of six inch mains may be permitted in cul-de-sacs where there is no fire hydrant installed within the court and shall not extend over 300'. All dead end mains shall be provided with a standard blow-off located behind the sidewalk or other acceptable means of flushing.

In all cases, water mains shall be of sufficient size to meet fire flow requirements as outlined by the requirements of the Insurance Services Office and the Fire Marshall.

Pipe sizes used in City of Brentwood public water systems are 6" (end of cul-de-sac only), 8", 12", 16", 18", 20", 24" and 30" or as approved by the City Engineer.

3. Pipe Materials

Allowable materials for publicly maintained mains are those specified in Section 130 of the City Standard Specifications.

4. Valves

All water valves shall be located in the middle of the travel lanes.

The distribution system shall be equipped with a sufficient number of valves so that no single shutdown will result in shutting down a transmission main, or necessitate the removal from service of a length of pipe greater than 500' in high density districts or greater than 800' in other districts; additionally, in no case shall more than two fire hydrants be removed from service. The valves shall be so located that any section of main can be shut down without going to more than three locations to close valves. The valve-operating nut shall be no more than two feet below the top of valve box. All valves for water mains less than or equal to 12 inches in diameter shall be gate valves with fully encapsulated wedge, resilient seat, and integral bronze nut and stem. All tees shall have three valves and all crosses shall have four valves. A valve shall be installed on each side of services to all hospitals, schools, commercial and major industrial sites as directed by the City Engineer.

5. Fire Hydrants

Fire hydrants shall be placed at the end of the bulb on all cul-de-sacs, at street intersections, and at a maximum spacing of 500' measured along the street frontage, and as approved by the Contra Costa County Fire District and by the City Engineer. Fire hydrants on streets without fronting residential lots shall have a maximum spacing of 1,000'. For streets with fronting residential lots, the maximum shall be 500' feet and 300' maximum on commercial/industrial developments.

The minimum size water main serving a fire hydrant shall be eight inches and no more than two hydrants will be allowed on any eight inches line between intersecting lines. No Connections to fire hydrant laterals will be allowed.

Fire hydrants shall be installed as specified in the City Standard Plans.

All design fire flows and residential pressures shall meet the criteria and shall be approved by the Contra Costa County Fire District.

6. Other Appurtenances

A blow-off assembly shall be provided at all low points in water main profiles. Temporary blow-off assembly shall be installed at the ends of any line subject to future extension.

Air release valves shall be constructed at all high points in water main profiles.

7. Services

Service lines from the water main to the property line shall normally be installed at the time the main is constructed to avoid frequent cutting of the street.

In all new subdivisions, the residential service line should be located on the centerline of the lot to be served. The service line to existing buildings shall be located so as to make the most direct connection to the existing structure.

Minimum service line sizes to single-family residences shall be one inch Type K soft copper tubing. Service lines in sizes up to and including two inches shall be Polyethylene NSF tubing. Zinc Anodes shall be provided and installed at the locations shown on the City of Brentwood Standard Plans.

Pressure reducing valves shall be required on all structures where pressure exceeds 80-psi. The pressure reducing valves shall be installed on the water entrance side of and at the location of the house gate valve. The pressure shall be set at 80-psi at the time of installation. It will be the responsibility of the applicant to show which structures will not exceed the 80-psi pressure.

8. Anchors

Concrete anchors or thrust blocks shall be provided at all bends, behind tees, fire hydrants, crosses which are valved in such a manner that they can be used as tees as shown on the City Standard Plans.

RESTRAINED JOINTS for ALL VALVES - add sentence

9. Fittings

Standard approved fittings shall be used at all bends of $11\frac{1}{4}^{\circ}$ and greater. Deflections shall not exceed 80% of manufacturer's recommended values.

10. Cover Requirements

Water mains and services shall be installed at a depth, which will provide a minimum of 36" from the top of the pipe to the subgrade. In case of utility conflict in which the water main is required to go over another utility, City Standard Plan W-14, "Concrete Cap over Water Main", applies.

11. Easement Requirements

On-site interior water lines outside the public right-of-way to be dedicated to the City shall require easement dedication.

Easements for water lines shall meet the more restrictive of the following width criteria:

- a. Minimum width of any easement shall be 15'.
- b. All easements shall have a minimum width in feet equal to the required trench width according to the standard detail for trench backfill, plus two additional feet of width for every foot of depth of the pipe as measured from the bottom of the pipe to finished grade. All water lines shall be centered within their easements.

12. Backflow Prevention Devices

Backflow prevention devices shall conform to current California Division of Drinking Water Standards.

8. NON-POTABLE WATER SYSTEM

A. GENERAL

1. Non-Potable Water system design within a development area shall conform to the City of Brentwood General Plan and Non-Potable Water Master Plan. The City Engineer shall approve any deviation from the City's Master Plan in writing. The City Engineer retains the right to require additional upgrading and sizing on all plans in accordance with the most recent Master Plan or as required assuring adequate fire flow and a reliable secure system. All improvements including extensions, replacements, and repairs shall conform to the requirements of the, National Board of Fire Underwriters, American Water Works Association Standards, City of Brentwood Regulations, and the Standard Plans and Specifications of the City of Brentwood.
2. The existing City of Brentwood non- potable water system supplies recycled or irrigation water within the developed area of the City. Brentwood uses a reservoir and pumped to pressurize its distribution system.
3. All City-owned non-potable water system facilities shall be installed only in public streets, or rights-of-way. Public water facilities within dedicated easements on private property are discouraged, and require the approval of the City Engineer.

B. DESIGN

1. Layout of Mains

The distribution system, whenever possible, shall employ the "Gridiron System" of water circulation so as to allow pressure equalization. All water pipelines designed for the transmission or distribution of non-potable water supply shall be constructed

and installed within the right-of-way of public streets or roads, unless such construction or installation is determined to be impractical by the City Engineer.

The applicant shall show, on the profile of improvement plans, inverts of pipe at all changes in grade in all areas where conflicts with other utilities might arise, the top of pipe will also be shown. A detail shall be drawn of such conflicts with sufficient information shown that the City Engineer can make a determination as to the adequacy of the solution shown.

2. Sizes

In general, the minimum size publicly maintained water main shall be eight inches in diameter. All dead end mains shall be provided with a standard blow-off located behind the sidewalk or other acceptable means of flushing.

3. Pipe Materials

Allowable materials for publicly maintained mains are those specified in Section 130 of the City Standard Specifications.

4. Valves

All water valves shall be located in the middle of the travel lanes.

The distribution system shall be equipped with a sufficient number of valves so that no single shutdown will result in shutting down a transmission main, or necessitate the removal from service of a length of pipe greater than 500' in high density districts or greater than 800' in other districts; additionally, in no case shall more than two fire hydrants be removed from service. The valves shall be so located that any section of main can be shut down without going to more than three locations to close valves. The valve-operating nut shall be no more than two feet below the top of valve box. All valves shall be gate valves with fully encapsulated wedge, resilient seat, and integral bronze nut and stem. All tees shall have three valves and all crosses shall have four valves. Blow-offs shall be installed on the ends of all pipe stubs at the boundary of development. A valve shall be installed on each side of services to all hospitals, schools and major industrial sites as directed by the City Engineer.

5. Other Appurtenances

Blow-offs shall be provided at all low points in water main profiles. Temporary blow-offs shall be installed at the ends of any line subject to future extension.

Air release valves shall be constructed at all high points in water main profiles.

6. Anchors

Concrete anchors or thrust blocks shall be provided at all bends, behind tees, fire hydrants, crosses which are valved in such a manner that they can be used as tees, and at valves, as shown on the City Standard Plans.

7. Fittings

Standard approved fittings shall be used at all bends of $11\frac{1}{4}^{\circ}$ and greater. Deflections shall not exceed 80% of manufacturer's recommended values.

8. Cover Requirements

Water mains and services shall be installed at a depth, which will provide a minimum of 36" from the top of the pipe to the subgrade. In case of utility conflict in which the water main is required to go over another utility, City Standard Plan W-14, "Concrete Cap over Water Main", applies.

9. Easement Requirements

On-site interior water lines outside the public right-of-way to be dedicated to the City shall require easement dedication.

Easements for water lines shall meet the more restrictive of the following width criteria:

- a. Minimum width of any easement shall be 15'.
- b. All easements shall have a minimum width in feet equal to the required trench width according to the standard detail for trench backfill, plus two additional feet of width for every foot of depth of the pipe as measured from the bottom of the pipe to finished grade. All water lines shall be centered within their easements.

9. STREET LIGHTING

A. GENERAL

These specifications shall cover the design and installation of streetlights, parking lot lights, and park trail lights. The design and installation of public street lighting systems shall conform to these standards, the City of Brentwood Standard Plans and Specifications, and Section 86 of the State Specifications, and Illuminating Engineers Society of North America (IES) Guidelines.

The applicant shall show the proposed street lighting system, parking lot lighting, or park trail lighting system on the project improvement plans.

The plans shall include the following items:

1. Location of electroliers, its pole number and lamp size.
2. Location of service point.
3. Locations of pull boxes.
4. Intensity of luminaries.

5. Wire size and length.
6. Mounting height and arm length.
7. Light distribution pattern.
8. Layout of street features including curbs, driveways, storm drain, sewer, water line, fire hydrants, catch basins, manholes, and walls.

Streetlight photometric shall be required whenever the designer has any variations from the City guidelines. At the minimum, the photometric shall include information such as average lighting level in foot candles, uniformity ratio (F_{Cavg}/F_{Cmin}), and maximum to minimum light level ratio (F_{Cmax}/F_{Cmin}).

Commercial (office)
 $F_{Cmin}=0.5$ and $F_{Cmax}=5-7.5$

Retail (Commercial)
 $F_{Cmin}= 1.0$, $F_{Cmax}= 10-15$ and $F_{Cmax}/F_{Cmin} = 10/1 - 15/1$

The applicant shall then obtain service locations from the Pacific Gas and Electric Company (PG&E).

The applicant shall obtain service ID numbers from the Engineering Department.

After the applicant receives the service locations, he/she shall determine the wire size and length of each conduit run. These items shall be shown in tabular form or denoted next to each conduit run on the plans.

The developer or contractor shall pay for the cost for all PG&E services. This shall include the PG&E connection charge for energizing streetlights. All streetlights shall be energized according to PG&E rate schedule LS-2A. Streetlights shall have a separate PG&E power source (not combined with irrigation controllers, traffic signals, etc.)

9. State the Lighting and Landscaping District Number for maintenance of the streetlights upon tract acceptance.

B. DESIGN

1. Spacing, Intensity and Mounting Heights
 - a. Streetlights for public lighting systems shall be standard or decorative streetlights as shown on the City of Brentwood Standard Plans. Determination of the type of light to be used shall be made by the City Engineer.
 - b. Light Emitting Diode (LED) fixtures shall be used for all streetlights. Each fixture shall have its own photocell. Minimum wire size shall be AWG No. 6.

- c. Standard streetlights shall have the following maximum spacing, minimum intensity and mounting heights according to the type of street the lights are to be installed on.

	SPACING (FT.)	LED FIXTURE	MOUNTING HT. (FT-IN.)
Residential Local	180	GCI-40E or 60E- MV-NW-3-GY- FDC-530-WL	31-6
All Residential Collector	180	GCI-40E or 60E- MV-NW-3-GY- FDC-530-WL	31-6
Arterial	165/200	GCI-60E or 80E- MV-NW-3-GY- FDC-530-WL	36-6
Collector	185/200	GCI-60E or 80E- MV-NW-3-GY- FDC-530-WL	36-6
Industrial/Commercial	180	GCI-60E OR 80E MV-NW-3-GY- FDC-530-WL	31-6

The City Engineer may approve variations to the aforementioned requirements on an individual basis.

- d. Residential and commercial decorative streetlights, when used, shall use 100-watt luminaries installed at 160' to 180' spacing on alternating sides of the street.

2. Pole Height and Arm Length

State Type 15 pole height shall be as shown on City of Brentwood Standard Plan SL-2 and Caltrans Standard Plan ES-6B. For poles installed behind the back of curb, the mast arm shall be 6' in length. Poles installed more than six feet behind the back of curb shall have longer mast arms so that the luminary head is located above the curb line. Poles installed within the median island on arterial streets shall use twin eight-foot mast arms.

Signal and lighting standards shall be as shown on current Caltrans Standard Plans ES-6J, ES-6K.

3. Location of Streetlights

- a. Whenever possible, streetlights shall be located on a property line or at a curb return.
- b. On streets with meandering (separated) sidewalks, the center of the lighting pole shall be located two feet from face of curb.

- c. On streets with monolithic curb, gutter, and sidewalk, streetlights shall be located so that the center of the pole is two feet from the back of sidewalk.
- d. Where there is only curb and gutter, the center of the streetlight pole shall be located two feet from the face of curb unless otherwise directed by the City Engineer.
- e. T intersections: For collector and residential streets, a streetlight shall be located on the through street along the projected centerline of the intersecting street. For thoroughfares, a streetlight shall be located at each mid-radius point.
- f. Cul-de-sacs: A streetlight shall be located at the end of the bulb.
- g. Four-way intersection/thoroughfares: Streetlights shall be located at all curb returns.
- h. Four-way intersection/thoroughfares and collector streets: Streetlights shall be located at the far right curb returns of the major street in the direction of travel.
- i. Four-way intersection/collector and residential streets: A streetlight shall be located at one of the returns.
- j. Electroliers should be staggered on opposite sides of the street. Electroliers shall be placed on the outer edge of continuous curves rather than the inside.
- k. Where traffic signals are installed, streetlights shall be included on signal poles wherever feasible, to reduce the number of poles at intersections.

4. Lighting Distribution Pattern

All street lighting shall be Type III, cut-off light distribution pattern with house side glare shield, except lights at the end of a cul-de-sac and decorative street lighting shall use a Type V light distribution pattern with house side glare shield.

5. Pull Boxes

- a. Pull boxes shall be spaced at a maximum of 200'.
- b. One pull box shall be located next to each electrolier on all streets.
- c. One pull box shall be located at each side of all street crossings, at or near the curb return.
- d. Pull boxes shall be placed immediately behind the sidewalk in sidewalk areas or between the streetlight and edge of sidewalk in meandering (separated) sidewalk areas.
- e. All pull boxes should have a security locking lid.

10. FIBER OPTIC CONDUIT SYSTEM

A. GENERAL

1. The fiber optic conduit system shall conform to the City of Brentwood Advanced Technology Master Plan, adopted August 22, 2000 by Resolution No. 2139. The City Engineer retains the right to require additional upgrading and sizing on all plans in accordance with the most recent Master Plan or as required assuring reliable fiber optic communication system. All improvements shall conform to the requirements of the manufacturers of the products, and the Standard Plans and Specifications of the City of Brentwood.

2. Ordinance No. 609 stipulates that the developer shall design, install, test, and dedicate to the City conduits within the public right of way and to design, install, test, and dedicate to the property owner conduits to the individual dwellings for the purposes of advanced technology systems.
3. The Fiber Optic Master Ring depicts the ultimate alignment of a fiber optic conduit system throughout the City and is designed to be "fiber optic" ready at a future time. The trunk line conduit system shall consist of 2 - 4" Φ conduits, or equivalent duct capacities. Currently with new development and Capital Improvement Projects, portions of the fiber optic conduit system are being installed. With future projects, the City anticipates linking all the conduits to form the Fiber Optic Master Ring (Trunk Line System).

B. DESIGN

Refer to the "Advanced Technology Master Plan" in Appendix AP-M of this manual for the guidelines.

1. Where applicable, the developer shall extend a fiber optic vault to all segments of the fiber optic trunk line and shall interconnect the trunk line conduit, if existing.
2. The joint trench designer shall submit a copy of the Approved Tentative Map with a schematic layout of the locations of the fiber optic main line (1-4" Φ conduit), fiber optic trunk line (2-4" Φ conduits), if applicable, and the node vaults (V_n) for the review and approval of the City Engineer.
3. The premise of the fiber optic design is that in the future when the fiber optic plant is pulled, the conversion from coaxial (C) to fiber optics (F) will take place at the Node Vault (V_n). The V_n vault is the only junction where the coaxial conduit (C) and fiber optic conduit (F) will interconnect. After that, the fiber conduit (F) goes into the Fiber Splice Vault (V_f) and the coaxial conduit (C) goes into the Service Vault (V_s).
4. The fiber optic conduit designer shall submit a design table (see below for sample template) that depicts maximum lengths and bends of all conduit runs and the designer shall certify that all design criteria has been met. This table shall be signed and stamped by a Civil Engineer registered in the State of California.
5. Sample Template: Fiber Optic Table

C A B L E				V A U L T T Y P E		NO of HOMES
ID#	Type	Length	Degrees Bend*	Out	In	
1	C	103'	90°	Ex. V_s	V_s	4
2	C	146'	0°	V_s	V_s	4
3	C	101'	0°	V_s	V_s	4
4	C	201'	0°	V_s	V_s	2
5	C	89'	0°	V_s	V_s	3

* Not counting 90° transition bends into vaults

C. CONDUIT LAYOUT CRITERIA

1. Fiber Optic Trunk Line (T), Fiber Optic Main Line (M) and Distribution Conduits (C):
 - a. No cable segment between enclosures may include more than 360 degrees of total bend, including an allowance of 90 degrees for the transition into each enclosure. In other words, there may no more than two 90 degrees bends in the conduit placed in the street, not counting the transition bends into the vault at each end of the segment.
 - b. Maximum length of conduit shall be 400' for runs with bends greater than 90 degrees, but less than 180 degrees (excluding the bends in and out of vaults).
 - c. Maximum length of conduit shall be 500' for runs with bends between 0 and 90 degrees (excluding the bends in and out of vaults).
 - d. Maximum length of conduit shall be 600' for straight runs (excluding the bends in and out of the vaults).
 - e. Termination into node vaults shall be gradually swept (15° -30° bends) to the elevation where the conduit enters through the side of the vault.
2. Service Conduits (S):
 - a. Service conduits extend between the service vault and the termination panel at each dwelling. Two service conduits must extend between each service vault and each dwelling served from that vault.
 - b. 80% of such conduits must be no greater than 120' in length and no conduit may be greater than 180' in length.
 - c. In order to limit cable tension during installation, no service conduit may include more than 270 degrees of bend, including the 90 degrees sweep up into the service panel at the dwelling and an allowance of 90 degrees for the sweep transition out of the service vault. Where bending in excess of 270 degrees is required, intervening service vaults must be employed.
 - d. All communications, cable and fiber optic conduit shall terminate into one point use panel, to be shared by all providers. Contact the Building Department for latest panel specification. Supply separate #10 copper ground wire from the UFER common building electrode to panel. A dedicated 20 amp circuit shall be located adjacent to the distribution hub and installed on the inside wall of the structure.

D. VAULT LAYOUT CRITERIA

1. Node Vaults (V_n):
 - a. Every new subdivision shall contain at least one node vault. These vaults shall be located near the entrance points of subdivisions in landscape parcels, so that the nodes can also serve homes in existing or future adjacent subdivisions.
 - b. The total length of the distribution (C) between the node vault and the most distance served home shall not exceed 2400'. If the distribution run is split to create multiple distribution branches, then the maximum length must be shortened by 150' per branch circuit.
 - c. No more than four distribution conduits may originate from any node vault.
 - d. No more than 300 homes may be served from any node vault.

- e. 120/240-volt electric power (at least 5 kW) must be available within 200' of the node vault location and must not require boring of streets to access.
 - f. Natural gas must be available within 200' of the node vault location and must not require boring of streets to access.
2. Fiber Splice Vaults (V_f):
- a. Fiber splice vaults shall be placed where each road leaves the subdivision and shall extend to the Fiber Optic Master Ring, if applicable. If the trunk line of the Fiber Optic Master Ring exists, interconnection of the trunk line to the vault is required.
 - b. Fiber splice vaults shall be placed as required to meet the maximum requirements for fiber optic trunk line (T) and main line (F) conduit lengths and total bend angle.
 - c. Vaults must be placed in such a way that they can easily be accessed for service.
3. Service Vaults (V_s):
- a. Service vaults are placed at locations where the two distribution conduits intersect pairs of drop conduits serving several homes. Wherever possible, each service vault should provide service to two, four, or six homes, with a strong preference for serving four home groups. It is occasionally permissible to serve three homes from a tap location, but serving five homes is not allowed.
 - b. In addition to providing a transition between distribution and service conduits, service vaults must be provided at every point where the service is stubbed-off for future expansion.
 - c. Additional service vaults may be required to limit pulling tension on cables in accordance with the criteria on distribution with the criteria on distribution conduit placement.

11. IRRIGATION SYSTEMS

A. GENERAL

- 1. Irrigation system shall be designed to complete one hundred percent (100%) ET of summer watering in an 8-hour period.
- 2. Minimum irrigation efficiency shall conform to City of Brentwood Model Water Efficient Landscape Ordinance (MWELo), Section 17.630.010
- 3. Booster pumps shall be used on all projects that will use reclaimed or non-potable water and/or has large turf rotors. All other systems shall be designed to operate at 50 PSI or less without a booster pump. City reserve shall be 20% higher than design pressure as recorded on City water chart, or a booster pump will be required.

B. CONTROLLERS

1. All enclosures shall be stainless steel. Electrical meter pedestal backflow enclosure and irrigation controller boxes shall be stainless steel with slant top lids. The slant top enclosures may limit configurations requiring more than one controller or device. Raised on a 12" above finished grade pad. Location of controllers and meters are to be screened per Joint Trench Plan Requirements, page JT-3.
2. The communication used in the system shall be cell configuration to all satellite units. Only the Controller manufacturer communications cable shall be used. Verify signal with nearest repeater site to determine antenna requirements.
3. Splices for communication cable shall be made ONLY in controller enclosures or in an approved pull box using a Serviseal Closure Kit Model-Super, manufactured by Preformed Products or approved equal. A 1½" conduit shall be used with pull boxes every 100 feet; splice boxes shall be provided at the end of the terminal of the conduit.
4. All irrigation systems shall include flow sensors and master control valves. These shall work integrally with the controller. The flow sensor shall connect to satellite components necessary for operation.
5. Rain guard switches shall be used on all AC powered irrigation controllers not connected to the Central Irrigation System.

C. VALVES

1. Check valves, either built-in or add-on, shall be installed on any 10' or higher slope. Use KBI brand or Rain Bird AVC-050 (½"), AVC-075 (¾") or AVC-100 (1", if not built-in) check valves.
2. Isolation valves shall be AVK (or approved equal) resilient-seated, full-ported gate valves with 2" hex head or approved equal.
3. Valve numbers shall be sequenced in geographic order.
4. Locate all valves outside of turf areas where possible.
5. Quick couplers shall be located next to tennis courts and picnic tables. There shall be one quick coupler at two opposing corners of the tennis court and one quick coupler within 40' of picnic tables, at each multiple valve location and at ends of all mainlines.

D. SPRINKLERS

1. No sprinklers shall be installed on fixed risers or quick couplers. Triple swing joints on all heads. – No marlex to marlex fittings.
2. Bubbler sprinkler ratio shall be one per shrub and two per tree. In lawn areas all trees shall possess 2 pop-up bubblers per tree. This shall also be on an

independent valve circuit. Gallonage per shrub or tree should be matched to overall plant requirement.

3. Sprinklers and piping shall be no closer than 12" from walkways, fences, curb, etc. and 12" from buildings and other permanent structures.

E. PIPES AND APPURTENANCES

1. Sleeves, twice the pipe diameter, are required under all pavements and shall have identifying marks on top of the curb or sidewalk and shall be between 24" to 30" deep but shall not exceed 36" deep. Installation of bio barrier fabric at the end of each sleeve is required.
2. Main line and lateral line irrigation pipe type shall be PVC-1120-1220, Type I, Schedule 40. Mainlines 2½" or larger, use class 315 PVC.
3. For pipes under three inches: PVC solvent welds, square cut, primer shall be used. For pipes over three inches, use ring-tight fittings.
4. Fittings to be used shall be Schedule 80 for main lines and Schedule 40 for laterals. Use a non-hardening thread sealant compatible with the pipe.
5. Pipe three inches in diameter and larger shall require thrust blocks.

F. WIRING

1. Valve wiring shall be UL approved for direct burial, copper, AWG-UF 600 volt #14 (minimum). Common wire shall be white (2 per system); control wires shall be of a different color other than white; spare wires shall be of a color different than the used station and/or common wires.
2. Wires shall be color-coded according to use and shall be labeled at clock with station numbers.
3. Spare wires shall run along the main line at a ratio of one extra wire per six stations used on clock. Provide a three feet wire loop inside all valve boxes
4. There shall be no valve wire splices other than in automatic valve boxes. Only Pentite, Snaptite or 3M-DBY Seal Pack shall be accepted for underground splice connectors.
5. Attach #10 wire to mainline and stub into all gate valve boxes and controllers.

G. WATERING

1. Irrigation system over-spray shall not be allowed in play areas, play courts, streets, sidewalks, picnic areas, booster pumps and controllers.
2. Watering of high usage and/or close contact areas (i.e. benches, picnic tables and picnic areas, play areas, water fountains, etc.) shall not be allowed. Watering of sidewalks shall be allowed in parks only where irrigation runoff and/or drainage is contained on site.

12. LANDSCAPING

A. GENERAL

1. All appropriately selected plants shall be grouped into hydro-zones.
2. All landscaping shall meet California Code of Regulations, Title 23, Waters, Division 2, Depart of Water Resources, Chapter 27, Model water efficient landscape ordinance requirements.
3. AB 1881 standards shall be met in all landscaped areas.
4. Areas under trees and shrubs shall be excavated to a depth of three feet in areas where previous compaction has occurred due to the construction of medians or parking lots and in areas where a road base was installed in the planting location. Remove all base rock to 30”.
5. A 10’ bench shall be provided at the top and bottom of all slopes adjacent to City owned property for maintenance requirements.
6. Drain tubes may not be necessary. Consult the soils report for the suitability of soil.

B. TREES

1. All tree-planting holes shall be scarified on all sides and bottom to remove any glazing.
2. Root deflection panels shall be provided on all trees within five feet of pavement. Install lineal panels parallel to pavement 12’ in length (6’ on either side of tree). If trees are planted within 10’ of soundwalls or property lines, a 36” x 12” long root barrier shall be installed at property line.
3. Trees shall not be planted in areas confined by pavement with less than 10’ from the pavement nor closer than 10’ from property line, fences or walls. Trees planted within 15’ of property lines shall be compact, small varieties. Keep trees 20’ away from streetlights, 35’ away from intersections and directional signage.
4. All trees shall be 15-gallon size, all other sizes shall be as approved by the Park and Recreation Department. Tree types and planting must conform to the City’s Urban Forest Guidelines.

5. "Lodge Poles" with four ties shall be used on all parks projects.

C. SHRUBS

1. Shrub type shall be a maximum of three feet in height, when mature, on any median or intersection radius in view of traffic.

D. TURF, ETC.

1. Turf area must allow a minimum of 10' between plant material and permanent structures for mower equipment use.
2. Turf varieties shall be a blend approved by the City. Varieties from the most recent University of California Cooperative Extension (UCCE) Turf Trials at the San Jose Research Center are recommended.
3. Irrigated meadows and slope situations shall be Hard Fescue (*Festuca ovina ssp. Duriuscula*) at a rate of:
4. Seed: 220 lbs./acre (95% purity, 85% germination)
5. Mulch: 1800 lbs./acre
6. R-binder: 60 lbs./acre
7. Fertilizer: 400 lbs./acre

E. EROSION CONTROL

1. For irrigated slope erosion, use Hard Fescue Fescue (*Festuca ovina ssp. Duriuscula*).
2. The following erosion control mixture shall be used for all non-irrigated hydro-seeded applications, unless otherwise noted:

Table I: Erosion Control Mixture

Botanical Name (<i>Common Name</i>)	Minimum % Purity	Minimum % Germination	Lbs./Acre
<i>Festuca meglura (Zorro Annual Fescue)</i>	95%	85%	20
"Hycon" Rose Clover	98%	90%	6
<i>Lupinus Nanus (Sky Lupine)</i>	90%	70%	4
<i>Eschscholtzia Californica (California Poppy)</i>	90%	70%	5
<i>Lobularia Maritima (Sweet Alyssum)</i>	90%	70%	4
Blando Brome	95%	85%	15
California Brome	95%	85%	10

3. The erosion control materials shall be mixed and applied in approximately the following proportions:

Table II: Erosion Control Materials Proportions

Material	Slope Measurement (per acre)
Seed	60 lbs.
Wood Fiber Mulch	1800 lbs.
Binder	80 lbs.
Fertilizer (20-20-10)	500 lbs.
Water	As needed for application

F. FERTILIZER

1. Fertilizer shall be a City approved product, at a recommended rate based on soil analysis. Best Paks (20-10-5) tablets must be installed at manufacturers recommended rates under all trees and shrubs.

13. PARKS AND TRAILS

A. GENERAL

1. Any park within a quarter ($\frac{1}{4}$) mile of a non-potable waterline is required to connect to and utilize non-potable water for irrigation.
2. Concrete "V" ditch at the base of the slope shall be adjacent to the property line.
3. On any planted slope (other than turf) greater than 3:1, jute netting is required.
4. Use sweeping curves for vehicular traffic from street through park.
5. Any fees associated with soil compaction, moisture, concrete and asphalt, sub-grade or sub-base tests shall be the responsibility of the contractor or developer.
6. All controls (timers, photocell, etc.) shall be located in the restroom storage area or in other permanent structure. Control devices shall have a bypass operation feature.
7. A 24" mow band shall be provided at the base of a fence. A 12" wide mow band must be along all turf interface areas.
8. A 12" mow band shall be provided at property lines where no walls or fencing is provided.

B. PARK SIGNS

1. Developer to provide, and install, standard City Park name signs as per City Standard Detail (L-19 or L-20). All concrete footing must be the same color as park signs.
2. Park regulation sign shall be installed at each park entrance.

3. Developer shall install signs at each park which shall include the contact numbers for construction, maintenance additionally signs must include anticipated completion date.

C. PAVING

1. Paving for parks and trails shall be concrete, unless otherwise approved by the Park and Recreation Department.
2. Main Access Path shall be a 10' width paving, six inches thick with #4 rebar at 24" O.C. and 1½ lbs. of fiber mesh per cu. yd.
3. Turf pavers shall be Tufftrack Grass Pavers by NDS or approved equal.

D. LIGHTING

1. City approved area lights shall be provided in all park areas. Access plates shall have vandal-proof screws. Construct a six inches concrete pad around the base.
2. Sport courts shall have a lighting system with a dedicated control device. Control timers shall be vandal-resistant, push button, solid state, re-settable and with control link capable.
3. The park lighting system shall have a separate PG&E meter and enclosure.
4. Electrical lighting conduits and pull boxes shall be provided on tennis courts if the lighting system is not installed at the time of construction.
5. All street light foundations shall be per Standard Plan SL-1, "Street Light Foundation."

E. PLAY AREA

1. Play equipment shall be metal and powder-coated.
2. Play area surfacing shall be rubberized resilient safety surfacing. Engineered wood "Fi-bar" may be used with approval of the Community Development Director.
3. Provide 10' of concrete curb and sidewalk around the play area.
4. There shall be at least one entry and one exit area from each play structure that has poured in place safety surfacing connecting to the play structure to the closest concrete pathway.

F. COURTS AND FIELDS

1. Tennis Court: Post shall be Patterson Williams #2201-40 with #8351 net.
2. Basketball Court: Concrete with sawed joints on 10' centers; standard dimensions with all typical painted lines and shall be sand blasted into final finish.
3. Baseball Fields: Use "Hollywood" brand or approved equal.
 - a. Base Anchors: BBP-44
 - b. Bases: BBP
 - c. Home Plate: HPS
 - d. Pitching: BBPB
 - e. Infield: 5" infield mix. Mix shall be cinder, clay sand mix approved by the City. Infield areas shall slope away from infield, including pavement behind backstop. "Play-Ball," "Turface" or other approved infield conditioner material shall be incorporated at manufacturer's recommendation.
 - f. Install 2" x 12" finished pressure treated Douglas fir at base of fence on infield side of fence-3' high behind home plate, 2' high along the rest of the fence.
 - g. Manual sprinkler system shall be installed in the baseball infield.
 - h. Metal shade structure over dugouts.

G. RESTROOMS

1. Vandal-proof fasteners shall be used on all inside fixtures and amenities.
2. Provide two inches diameter water service supply to building.
3. Cleanout shall be installed at drinking fountain trap. Provide a pressure regulator on supply line to avoid fluctuation.
4. Roof details shall match the subdivision's design. Whenever applicable, check the Subdivision's Conditions of Approval.
5. For plastic panels, Santana integral color plastic partitions
6. Fluorescent lights shall be vandal proof fixtures: one on each exterior corner of building, one over lavatory, one over toilet area and one in storeroom. All lights shall be on timer, except storeroom.
7. Install pneumatic closures on the exterior doors.
8. City-approved automatic door locks shall be installed on restroom doors.
9. Provide appropriate state-approved signs.
10. Separate remote shut-off valve for building drinking fountain shall be located inside building chase.
11. Provide for a shut-off valve for the building water supply.

12. Hose bib with check valve shall be installed inside each restroom.
13. All fixtures shall be of penal quality stainless steel design.
14. Sink faucets shall be self-closing.
15. Each area/room shall have its own floor drain.
16. Sewer clean out shall be located outside building.
17. Toilet paper dispensers shall be roll type. Submit for approval.
18. All roof sewer vents shall be capped.
19. Phone line shall be stubbed into storeroom for irrigation controller.
20. Separate 100-amp service to circuit breaker panel for use by City mobile stage.
21. Eliminate outside privacy partition that attaches to building. Leave partition that is placed in front of door.
22. Install an electrified exit time lock device with timer (such as is available from Adam Rite Manufacturers) and battery backup on restroom doors.
23. All interior walls shall be covered with Fiberglass Reinforced Concrete (FRP).
24. Use stainless steel mirrors.

H. DRINKING FOUNTAINS

1. Drinking fountain shall be Most Dependable Fountain (“MDF”)- Stainless Steel or approved equal.
2. Drinking fountains shall be located outside of the 100’ radius of any sand lot.
3. Provide one drain cleanout and one shut-off valve in boxes next to the drinking fountains. All screws shall be vandal-resistant. See Standard Plan L-13 and L-14 for details.
4. Bac-T and Backflow Tests shall be the responsibility of the Developer. Test to be performed before activation of water supply.

I. OTHER STRUCTURES

1. Removable bollards shall be powder-coated round steel pipe Timberform 2190-3R or approved equal, see Standard Plan L-12 for details. City shall be provided with locks keyed to the City system. For all parks and City owned facilities, collapsible bollards and specifications to be followed.

2. Park benches shall be made of recycled or plastic-coated expanded metal with arm rests.
3. City approved garbage can holders shall be located on pathways on its separate pad alongside the path. City shall be provided with locks keyed to the City system. Other locations of the garbage cans:
 - a. Two cans next to tot lot located at the opposite ends of the area.
 - b. One can next to the restroom.
 - c. One can next to every two picnic tables.
 - d. Two cans next to dugouts at baseball fields.
 - e. Two cans per tennis court or basketball court.
4. Any park area shall have two barbeque grills (MDF # or approved equal) per three picnic tables (Dumor # or approved equal). Additionally, park area shall include 1 garbage can per every 2 tables. Picnic tables (embedment) must be DuMor recycled furnishings. NO BARBEQUES TO BE PLACED NEAR PLAY AREAS.
5. Pet stations: Use "Mutt Mitts" dispensers or approved equal. See City Standard Detail (L-17)

14. SOLID WASTE REFUSE AND RECYCLING ENCLOSURES

Refer to the "Solid Waste Plan Guide and Enclosure Standards" in Appendix AP-H of this manual for the guidelines.

INSPECTION AND ACCEPTANCE PROCEDURES

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1. CONSTRUCTION AND INSPECTION OF IMPROVEMENTS AND PERMIT WORK.

All utilities need to be located and a copy of the USA ticket number must be current within fourteen (14) days of ticket date.

Construction Easements, additional Right-of-Way Purchase, Right of Entry signed by the owner and the like shall be finalized and approved as well.

The following is the sequencing of inspection in the course of construction:

A. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

1. A Storm Water Pollution Prevention Plan (SWPPP) must be submitted and approved by Public Works, Engineering Department. An approved copy must be kept on the construction site; additionally the Contractor shall be responsible for complying with its requirements.

B. ROUGH GRADING

1. A pre-construction meeting shall be held with the City Inspector and the Project Manager/s before the start of the site grading.
2. All required signatures shall be in place on all sets of Grading Plans distributed for construction. These complete city-approved sets of Rough Grading plans shall be available at all times on site.

C. FINAL GRADING

1. At the time of Final Grading, signed letters by the Engineer of Record and/or Geologist attesting to the following compliances shall be submitted:
 - a. Certificate of Rough Grading completion.
 - b. Certificate of Compaction.
 - c. Certificate of Building Pad.
 - d. Soils Report.
 - e. A copy of the grading plan depicting the correct pad elevations.
 - f. The construction of the Retaining Walls shall be completed.

D. WET UTILITIES INSTALLATION

1. A pre-construction meeting shall be held a minimum three working days with the City Inspector and the Project Manager before the installation of all wet utilities.
2. All plan submittals shall be City-approved and available on site. All plan sets distributed for construction shall be signed by the City Engineer.
3. Installation of the sewer lines according to the Improvement Plans.
4. Installations of the storm drain lines according to the Improvement Plans.

5. Subgrade shall be achieved before the installation of the water lines according to the plan specifications.
6. Installation of the water lines according to the Improvement Plans.

E. JOINT TRENCH UTILITIES INSTALLATION

1. A pre-construction meeting shall be held with the City Inspector and the Project Manager/s before the installation of joint trench utilities.
2. All plan submittals shall be approved by the City and all other involved agencies. All plan sets distributed for construction shall be signed by the City Engineer.
3. Installation of all Joint Trench Utilities according to the plan specifications.

F. STREET LIGHTS

1. Installation of the street lights according to the city-approved Joint Trench Utility plans and Standard Plans & Specifications.
2. Inspection of pier holes, anchor bolts, ground wire and concrete placement shall take place. Concrete cylinder testing of pier foundations shall be taken at 4500 psi.

G. PAVEMENT SECTION

1. The subgrade, curb and gutter shall be graded, processed and compacted. Once the compaction passes, the 'R' value of the soil may be taken if a street section modification if desired.
2. The Project Surveyor shall certify subgrade and shall provide a written certification of such.
3. 100% percent of the aggregate base (AB) for street curb and gutter shall be brought in and installed.
4. AB shall be compacted to 95% percent ASTM. Remaining Aggregate base (AB) shall be tested for 95% percent compaction. City Inspector shall approve grade and certify on site and prior to acceptance all streets will be slurry sealed per City Standards at the discretion of the City Engineer.
5. Curb, Gutter and Sidewalk forms/string lines shall be inspected and approved before the placement of concrete. The concrete shall cure at 2500 psi or seven days whichever comes first prior to the placement of remaining Aggregate Base.

H. WET UTILITIES INSPECTION

1. Photos of all exposed improvements including all connections to existing facilities shall be submitted prior to placing backfill.

2. At the completion of at least 80% of rock grade, all sewer and water lines shall be tested. Only authorized City staff are permitted to turn valves or otherwise pressurize proposed City pipes and appurtenances with water.
3. Sewer lines shall be balled, flushed and TVed, where a tolerance shall be maintained on sagging. A deflection test with a mandrel is required for all plastic sewer line. Sewer lines that did not meet the tolerance requirement shall be repaired based on the discretion of the City Engineer. All sewer laterals shall be TVed prior to the issuance of the Occupancy Permit.
4. Water line pressure shall be tested at 150 psi for four hours. It will then be chlorinated. Chlorine has to set in the water line for a minimum of 24 hours before it is flushed out.
5. Water samples shall be taken for laboratory testing and certification to guarantee the absence of bacteria (Note: verbal certification is acceptable prior to the written certification that will be supplied to the City within 10 days of sampling. Samples shall be taken at extreme ends of the system including fire hydrants, meter services and/or ARV's. Sample quantities and locations shall be at the discretion of the City Engineer.
6. Vacuum testing of sewer manholes are mandated.

I. ASPHALT INSTALLATION

1. Prior to the placement of asphalt, an asphalt mixture shall be submitted according to the City Standard Plans and Specifications. All sewer and water testing shall be completed prior to placement of asphalt.
2. Placement of asphalt per the pavement design section on the improvement plans in minimum 2 to 2½ inches lifts.
3. Compaction testing of Asphalt shall be required during paving of all lifts to ensure that it has met the City and Caltrans requirements and specifications.
4. Building permits can be issued only after completion of the first lift of pavement minimum throughout the entire project scope identified on approved improvement plans.
5. Contractor shall adjust required sewer manholes and water valves at least 48 hours after paving of top lift. If only bottom lift is paved all water valves need to be accessible.

J. IRRIGATION SYSTEM AND LANDSCAPING INSTALLATION

1. A pre-construction meeting shall be held with the City Inspector before the construction of site begins. See "Pre-Job Meeting Information and Checklist" in the Appendix section.
2. A SWPPP plan shall be in place with all basins protected and shall be kept on site at all times.

3. NPDES shall be in place year round. It shall include straw rolls, basin bags, etc.
4. Two sets of submittals, in individual binders, shall be submitted to the city by pre-construction meeting. A copy will be forward to the Contractor after approval.
5. A written construction schedule shall be provided to the city before the work commences and shall be updated weekly thereafter.
6. After installation of the irrigation system, the contractor shall provide the following:
 - a. A table of specifications listing all information which includes the actual soak time, flow rates, cycle time, landscape coefficient and precipitation rate for each valve.
 - b. A certification from the manufacturer's representative indicating that the installation is appropriately complete according to specifications.
7. Pressure-check the mainline irrigation system at 150 psi for two hours. Pressure check lateral lines at 75 psi for one hour.
8. A 14-day watering period and coverage checks shall be required before planting. This period includes weed-removal before a final grading is performed.
9. Irrigation coverage test shall occur before any planting takes place. No planting shall commence until the entire irrigation system is in a fully automatic operation.
10. Soil Preparation:
 - a. All construction materials shall be removed prior to soil preparation.
 - b. Contractor shall pay for a pre-plant soil analysis from a City-approved laboratory, where City staff shall collect samples and send to the laboratory. Resulting recommendations of the analysis shall be supplied to the City.
 - c. A City inspector shall be present when soil amendments are added.
 - d. Prior to planting, the contractor shall pay for subsequent post amendment soil testing to verify compliance of the resulting recommendations.
 - e. Minimum amendments shall be six (6) cu. yards/1,000 sq. ft. of nitrified Redwood or Fir compost, roto-tilled eight inches into native soil, unless soil test determines otherwise. Amendments shall be added when grading is at +/- 0.1% of the finish grade.
 - f. A three inch (3") layer of 1/2" – 3/4" bark mulch (walk-on or chips) shall be distributed over the areas of ground cover, under shrubs and trees and shall be maintained at that thickness until City acceptance, unless soil tests determine otherwise.
 - g. City shall be notified three days prior to amending or fertilizing planting areas for inspection during work.
 - h. Prior to sand and bark installation, a pre-emergent herbicide shall be applied to all groundcover, non-planted areas and tot lots at manufacturer's recommended specified rates.
 - i. Prior to installation, the City shall inspect all plant material. Notify the City forty-eight (48) hours in advance prior to inspection.

- j. Provide a written one year guarantee on all site improvements which shall begin on the date of City Acceptance.
 - k. Installation of play area equipment shall meet all Federal, State and Consumer Product Safety Commission (CPSC) and NRPA Standards.
 - l. There shall be a 90-day maintenance period after the final inspection on all areas. The developer is responsible for scheduling inspections every thirty (30) days during the required 90-day maintenance period. If any of these provisions are not met, inspection period shall re-commence at the beginning of the 90-day maintenance period.
 - m. City shall be notified three days prior to amending or fertilizing planting areas for inspection during work.
11. Playground Installation Certification shall be submitted to the City Inspector after the installation of the playground equipment. A National Playground Safety Institute Certified Inspector shall complete certification at the contractor's expense.
 12. Front Yard and Side Yard Irrigation and Landscaping Installation (per Building Department requirements).

K. PUNCH LIST

1. A walk-through with the applicant/permittee, contractor or their representative shall be conducted with the City Inspector in charge of the project. A walk-through shall be performed only upon completion of all improvements as shown on approved plan and required and included as part of Conditions of Approval for a project and a minimum of 80% occupancy of homes in residential projects.
2. A punch list shall be provided to the developer for compliance. Completion of all items must be done within three months.
3. The City Inspector shall verify the completion of all punch list items by walkthrough of the project and shall either provide an itemized list of remaining issues to the Developer/Contractor or submitting a "Letter of Completion" to the Engineering Department recommending that the project can be processed for City Council acceptance and release of applicable bonds (refer to "Documentation for Project Acceptance" proceeding this section).

Note: After the City Council acceptance of the improvements, the maintenance/warranty bond shall take effect for one year.

4. Nine months after the City Council acceptance of the project, the City Inspector will conduct another documented punch list walk-through, which will also be provided to the developer/owner.
5. Developer/owner shall complete and satisfy all punch list items by the 11th month of the one year maintenance/warranty period. Once the maintenance/warranty period has expired, and all punch list items have been completed, the maintenance/warranty bond shall be released.
6. If the developer/owner has not completed the punch list items by the 11th month within the one year maintenance/warranty period, the City will send a letter to the

bonding company requesting that the required funds be made available to the City for the completion of the project per the final punch list items.

2. VIOLATION AND ENFORCEMENT

- A. Should a violation of the City Municipal Code, Standard Plans and Specifications, Procedures or permit provisions occur, enforcement shall be pursuant to the following steps:
1. 1st Violation: Verbal Warning
 2. 2nd Violation (within 24-hours): Written Warning including:
 - a. Date of violation
 - b. Location of violation and permit number, if applicable
 - c. Description of violation
 - d. Subsequent enforcement actions should violation not be remedied
 - e. Required timeframe of remedy
 - f. Name and contact information of inspector issuing violation
 3. 3rd Violation (within 24-hours of 2nd Violation): Immediate Stop Work Notice
- B. Notwithstanding notice procedures outlined above, violations deemed an issue of public health or safety may be subject to an Immediate Stop Work Notice. Additionally, the City reserves the right to other enforcement provisions as necessary that may be available pursuant to City Code and State law.
- C. Should a Stop Work Notice be issued, work may resume only by written authorization provided upon remedy of the violation to the satisfaction of the City Engineer.

3. DOCUMENTATION FOR PROJECT ACCEPTANCE AND SECURITY RELEASE

Acceptance action shall be by City Council if improvements are to be owned and/or maintained as City Assets upon completion.

- A. Applicant/permittee shall submit a formal request for project or work acceptance, listing all bonds with the corresponding amounts to be released.
- B. **ALL** improvements, as shown on approved plans, and required and included as a part of Conditions of Approval for a project or permit, as well as a minimum of 80% of home occupancy in residential projects, shall be completed prior to acceptance of improvements by the City. Various scopes of work shall not be accepted independently of the entire project completion without special consideration and approval by the Director of Engineering/City Engineer.
- C. Written certification from other involved agencies and/or parties (when applicable), not limited to those referenced below, stating that all work required on the project in their jurisdiction has been accepted:
1. US Army Corps of Engineers

2. Contra Costa County Flood Control – Acceptance Letter
 3. Contra Costa County Department of Health ServicesCalifornia Department of Fish and Game
 4. East Bay Municipal Utility District (EBMUD)
 5. Contra Costa County
 6. California Department of Transportation (Caltrans)
- D. A written certification to the City of Brentwood Engineering Department shall be provided with a statement that all grading and improvements have been substantially graded and constructed as shown according to the approved plans. Certification shall also state all building pads and street subgrades have been constructed within .10' of approved plans.
- E. A written statement by the project surveyor shall be provided to the City certifying that survey monuments have been set in accordance with the approved and recorded Final Map. In addition, the letter shall state that the surveyor on record has been paid for their services.
- F. The following soils and geologic grading reports shall be submitted:
1. Soils Compaction Test Results (including location and elevation of field density test).
 2. Daily Reports.
 3. Summaries of field and laboratory test and other substantiating data on any changes that earthwork compaction and improvements were constructed in accordance with the plans and specifications.
 4. A letter from the soils company who conducted all tests that their services had been paid for their services.
- G. All punch list items shall be completed prior to requesting project acceptance.
- H. A complete set of "Record Drawings" (As-Builts) shall be submitted including a statement clearly marked on each sheet, date stamped and signed by the record engineer or architect, stating accurate field conditions. Electronic copies of each plan listed below shall be submitted for review by the inspector. Once plans have been reviewed by the inspector you will be directed to either revise the drawings per field conditions.
1. Grading & Erosion Control Plans including retaining walls and subdrains
 2. Improvement Plans (On and Off Site)
 3. Joint Trench Plans

- 4. Soundwall Plans
- 5. Landscape Plans

The set of "Record Drawings" shall show all original signatures as previously signed when the City approved said plans.

Under no condition shall the City accept Record Drawing plans marked as "Previously Approved" on any of the signature blocks. (This requirement applies to all plans not limited to Grading, Improvement, Joint Trench Utility, Irrigation, Landscape, Erosion Control or Traffic Signal and Striping).

- I. Electronic files of the "As- Built" with the required data as stated in the Submittal Procedures section.
- J. All outstanding charges billed to the developer by the City shall be cleared and must be paid in full, ie, invoices, overtime charges, citations, water bills, plan check deposit accounts.
- K. Certify all cathodic protection at each test station and provide certification.
- L. Submit maintenance/warranty bonds.
- M. All hydrant water meters shall be turned in and all water bill balances must be paid in full.
- N. All off-site improvements shall be completed and accepted prior to or concurrently with the on-site improvement project acceptance.
- O. All streets slurry sealed including signing and striping, per City Standards
- P. Bolt down all utility boxes, irrigation boxes and storm drains.
- Q. "Drains to Creek" labels in all applicable locations.
- R. Replace all missing paving markers on Detail 22's.
- S. Remove all silt bags, sand bags.
- T. Irrigation and Landscape: At the final 90-day walk-through, the following are required to be submitted to the Community Development Department:
 - 1. Three full sets of landscaping and irrigation plans, annotated to show actual flow rates for each controller zone. Actual pressure shall be indicated in the submission.
 - 2. An inventory on all irrigation equipment, plant counts, and area measurements (not limited to turf, ground cover, and hardscape).
 - 3. Two sets of 11" x 17" reduced scale, plastic-laminated, "As-Built" irrigation layout plans showing color-coded and numbered irrigation circuits.

Note: One set shall be an inset into door of irrigation controller.

4. Certification by John Deere Landscapes indicating that irrigation controllers are fully operational (to include telemetry line).
5. Backflow Certification must be current.
6. Bac-T Certificate for drinking fountains.
7. Copy of the Building Inspector's Final Inspection.
8. Meter Pedestal- provide copy of final electric meter pedestal permit.
9. Two Specifications and User's Guide Instruction Manual for operations and maintenance of the irrigation controller. One copy will be inserted in the door of the irrigation controller.
10. Two copies of the Operations Manual for accessory improvements or specialty items in a three-ring binder. It must include manufacturer data sheets, maintenance and parts information on all equipment installed (with exploded views for each piece of equipment), and supplier from where those parts were obtained.
11. A written certification from the developer guaranteeing all site improvements from any defects within a year.
12. A monthly irrigation schedule specifying the estimated water use and the documented actual flow rate from the contractor.
13. Written manufacturer's warranty statement for all components. All manufacturer and contractor warranties shall commence after City's acceptance of the project.
14. A maintenance kit including maintenance manuals and parts manual for playground equipment shall be provided to the City.
15. The following equipment shall be provided and turned over to the Park and Recreation Department's representative:
 - a. Two sets of sprinkler wrenches.
 - b. Two sets of keys for irrigation controller, meter pedestal and booster pump.
 - c. Two quick coupler keys with hose swivels.
 - d. Two sets of special tools for each piece of equipment.
 - e. Backflow enclosure and insulation cover.
16. Most recent Utility Bill relating to irrigation and landscape.

APPENDIX

Reference documents and forms mentioned in this manual can be found on the City's website at the following links:

Advanced Technology Master Plan

<http://www.brentwoodca.gov/civicax/filebank/blobdload.aspx?BlobID=35187>

Encroachment Permit Application and Notes

<https://www.brentwoodca.gov/home/showpublisheddocument/3196/638291859945170000>

Encroachment Permit Bond Form

<https://www.brentwoodca.gov/home/showpublisheddocument/3658/638260712086770000>

Grading Permit Application and Notes

<https://www.brentwoodca.gov/home/showpublisheddocument/3248/638261517722600000>

Maintenance Bond Form

<https://www.brentwoodca.gov/home/showpublisheddocument/3254/637804407388400000>

Plan Check/Permit Submittal Application

<https://www.brentwoodca.gov/home/showpublisheddocument/3254/637804407388400000>

Plan Sheet Samples

<https://www.brentwoodca.gov/home/showpublisheddocument/3672/638229560975770000>

Plan Sheet Templates (DWG File Format)

<https://www.brentwoodca.gov/home/showpublisheddocument/4636/637817648880530000>

Solid Waste Plan Guide and Enclosure Standards

<https://www.brentwoodca.gov/home/showpublisheddocument/3284/637804410959100000>

Subdivision Faithful Performance Bond Form

<https://www.brentwoodca.gov/home/showpublisheddocument/3260/637804407399570000>

Subdivision Labor and Material Bond Form

<https://www.brentwoodca.gov/home/showpublisheddocument/3262/637804407402930000>

Unit Price List for Bond Estimates

<https://www.brentwoodca.gov/home/showpublisheddocument/4638/638260719560630000>