Recording requested by, and
when recorded return to:

The Law Offices of George S. Burns
Attn: Kathy Schwertfeger
4100 MacArthur Blvd. #305
Newport Beach, CA 92660

DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS

AND MAINTENANCE AGREEMENT

OF THE SEA SHELL ESTATES

Tract No. 2870

Portion of Lot 11 of the Subdivision of Rancho San Bernardo

CITY OF MORRO BAY
SAN LUIS OBISPO COUNTY, CALIFORNIA

THIS INSTRUMENT IS RECORDED IN THE COUNTY OF SAN LUIS OBISPO AT
THE REQUEST OF

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DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS

AND MAINTENANCE AGREEMENT

OF THE SEA SHELL ESTATES

THIS DECLARATION is made this 14th day of January 2014, by Seashell Estates LLC, hereinafter referred to as "Declarant", with reference to the following facts:

WHEREAS, Declarant owns certain real property (hereinafter referred to and defined as "the Development") located in the incorporated area of the City of Morro Bay, County of San Luis Obispo, State of California, described as follows:

> Lots 1 through 10, inclusive, of Vesting Map Tract No. 2870, as shown on the Map recorded in Book ___, Page ___ Recorder of the County of San Luis Obispo, State of California.

WHEREAS, Declarant will convey the parcels in said Development to individual Owners, subject of certain protective covenants, conditions, restrictions and reservations as hereinafter set forth;

NOW THEREFORE, said Declarant, the fee Owner of said Development, hereby makes the following Declaration as to the divisions, easements, rights, covenants, restrictions, limitations, conditions and uses to which the above-described Development may be put, hereby specifying that said Declarant, its successors and assigns, and all subsequent Owners of all or any part of said Development, together with their grantees, successors, lessees, heirs, executors, administrators, devisees, or assigns.

The Declarant, its successors an assigns, and all subsequent Owners of all or any part of the Development shall not discriminate against or segregate any person or group of persons on account of race, color, creed, religion, sex, marital status, age, handicap, national origin or ancestry in the rental, sale, lease, sublease, transfer, use, occupancy, tenure or enjoyment of discrimination or segregation.

ARTICLE 1 - DEFINITION OF TERMS

Unless expressly provided otherwise, the following terms as used herein shall have the following meaning:

1.1 Access Roads. Access Roads refers to those roads as shown on the Final Vesting Map No. 2870.

1.2 Biological Mitigation Plan. Biological Mitigation Plan shall refer to that certain Plan approved by the City of Morro Bay, as required by the Conditions of Approval, and which is attached hereto as Exhibit D which is incorporated herein by reference.

1.3 Building Envelope. Each Lot is limited to a maximum of 6,600 square feet Building Envelope. Within each envelope a maximum of the following are allowed: a 3,600 square foot Building Footprint, a 1,000 square foot fenced area and a 2,000 square foot unfenced area. The driveway is not considered as part of the Building Envelope. The Building Envelope must be placed within the Development Limit Line for each Lot identified on the Final Vesting Map No. 2870 attached hereto and by this reference made a part hereof as Exhibit "A" and outside the easements, setbacks and conservation areas.

1.4 City. The City shall mean and refer to the City of Morro Bay.

1.5 Conditions of Approval for Tract No. 2870. The Conditions of approval for Tract

No. 2870 shall mean the approval by the City Council of the City of Morro Bay on April 13, 2009 for the Vesting Tentative Tract Map (S00-062), Conservation Subdivision, Conditional Use Permit (UPO-138), Coastal Development Permit (CPO-207) attached hereto by this reference made a part hereof as Exhibit "B".

1.6 Declarant. Seashell Estates LLC its successors and assigns, if such successors and assigns acquire or hold record title to any portion of the Development for development purposes.

1.7 Declaration. This Declaration, as it may be amended from time to time.

1.8 Design Manual. The Design Manual attached to this Declaration as Exhibit "C" creates a direction for architectural styles and for the overall design and continuity of theme for the Development. The Design Manual covers specific design criteria, which are to be incorporated into the individual Lots, building designs and landscape designs.

1.9 Design Review Committee. The Design Review Committee ("DRC") is a Committee created to advise Lot Owners and ensure compliance with the Design Manual and the provisions of this Declaration. As required by the Conditions of Approval for Tract No. 2870, the DRC shall include at least two technically trained persons from an architectural firm (one shall be a licensed architect) and one property Owner.

1.10 Development. Development shall mean the real property including all structures and improvements thereon authorized by the Conditions of Approval.

1.11 Development Limit Line. The Development Limit Line is the area within which the Building Envelope is allowed to occur within each Lot; within the Building Envelope defined in Section 1.3.

1.12 Drainage Areas. Those areas shown as Drainage Areas on Final Vesting Map No. 2870.

1.13 Family, Single Family. "Family" or "Single Family" shall mean occupation and use of a residence in conformity with these Restrictions and the requirements imposed by the City's single-family zoning ordinance or other state or municipal rules and regulations.

1.14 Final Improvement Plans. Final Improvement Plans shall mean those improvement plans on file approved by the City of Morro Bay on file with the Public Services Department of said City, regarding the Conditions of Approval for Tract No. 2870.

1.15 Final Vesting Map No. 2870. Final Vesting Map No. 2870 shall mean that map recorded in the records of the Recorder of the County of San Luis Obispo in the Book and Page referred to in the recitals set forth above, a copy of which is attached hereto as

Exhibit A.

1.16 Front Yard Landscaping. "Front Yard" landscaping applies to the frontage between the house and Sea Shell Cove within the 6,600 square foot Building Envelope of the individual Lots (inclusive of portions within private patios and fenced yards).

1.17 Guest Parking. At least one exterior parking space per Lot shall be provided for guests. The Guest Parking space shall be provided within the Building Envelope.

1.18 Lot. The "Lot" means any plot of land shown on the recorded subdivision map of the Development. The Lots are referred to thereon as Lots 1 through 10 inclusive.

1.19 Mortgage. A deed of trust as well as a Mortgage, both of which are security for the performance of an obligation.

1.20 Mortgagee. A beneficiary under or holder of a deed of trust as well as a Mortgage.

1.21 Owner. The record Owner, whether one or more persons or entities, including Declarant, of the fee simple title to any Lot, but excluding those having such interest merely as security for performance of an obligation, together with contract purchaser in possession.

1.22 Open Space. Open Space, Open Space Easement, or Open Space Area, shall mean those areas shown as an Open Space Easement and subject to the restrictions set forth on Final Vesting Map No. 2870, and those areas added to the Open Space restrictions pursuant to section 5.8 of this Declaration...

1.23 Other Common Area. Other Common Area refers to the drainage infrastructure and conveyances, slopes and retaining walls adjacent to roadways on either side of the access roads, the access roads drainage area and detention basin, sewer, tract landscaping and sidewalks as shown on the Final Improvement Plans for Final Vesting Map No. 2870.

1.24 Road Maintenance Committee. The Road Maintenance Committee (RMC) is the three (3) member committee which, pursuant to this Declaration, will be responsible for the Maintenance and Repairs of the Access Roads and the Other Common Areas.

ARTICLE 2 – DESCRIPTION OF LAND AND IMPROVEMENTS

2.1 Description of Land and Improvements. The land within the Development consists of ten (10) Lots to be constructed with single family detached residential homes. Each of Lots 1 through 10 shall be limited to one (1) single family residence.

ARTICLE 3 – USES OF THE REAL PROPERTY

3.1 Residential Use: Obligation to Rebuild. The real property is hereby restricted to residential use. No buildings or structures shall be erected or placed, temporarily or permanently, upon the real property other than the structures bounding the residential units properly constructed with Permit issued by the City of Morro Bay.

Declarant shall have the right to designate from time to time and use one or more Lots owned or leased by it for sales offices. This right shall terminate upon the sale of the last residential Lot in the Development.

3.2 Restrictions of Use. The property shall be subject to the following restrictions:

(a) Each residential unit shall be used as a residence for a Single Family in compliance with applicable zoning regulations and in compliance with this Declaration. Each of Lots 1 through 10 shall be limited to one (1) Single Family residence and one (1) guest suite; as such term is defined by City Ordinance.

(b) No advertising signs, billboards, or unsightly objects shall be erected on the Development, except that one (1) sign of customary and reasonable dimensions may be used for the sole purpose of advertising for sale any Lot or Lot(s). This provision shall not be applicable to Declarant.

(c) No obnoxious or offensive activity shall be carried on upon any portion of the Development, nor shall anything be done thereon which may be or may become an annoyance or nuisance to the neighborhood or which shall increase the rate of insurance on adjacent residential Lot.

(d) All clotheslines, storage piles or other unsightly objects shall be substantially screened from neighboring properties at all times while maintained within the Development.

(e) All rubbish, trash, or refuse shall be placed and kept in covered containers of a type and style which will prevent such garbage, trash or refuse from being dispersed by wind conditions or interference by animals. In no event shall such containers be maintained where they would be visible from neighboring property, except when necessary to make the same available for rubbish collection and then only for a maximum period of twenty-four (24) hours.

(f) No combustible material or any other material which would increase the risk of fire, excluding normally maintained household products, shall be stored on the Development. No tank for the storage of gas or other flammable liquid shall be installed on or in the Development.

(g) All driveways, sidewalks, entries and passages outside of the residential units shall remain unobstructed and shall not be used for purposes other than ingress and egress to and from the residential Units.

(h) The use of automobiles, motorcycles, or motor driven vehicles of any kind, other than landscape maintenance equipment, upon any Lot subject to this Declaration shall be limited to the paved driveway and garage areas. Garages shall be used to park the automobiles and/or other vehicle belonging to the Owner or occupants of the residential unit and for other purposes not incompatible with such use. Automobiles should be kept in the garage when not in use.

No trailer, boat, or recreational vehicle of any kind shall be parked on any street or Lot where visible from the street or another Lot for longer than forty-eight (48) hours. No painting, repairing or mechanical work, other than customary maintenance work and minor emergency repairs, shall be done on any Lot except in enclosed areas, which areas shall be sufficiently screened from the street and other Lots to eliminate any possibility of a nuisance being created by storage of such items or activities involving such items. The provisions of this paragraph shall not apply to temporary construction shelters or facilities maintained during, and used exclusively in connection with, the construction of any work of improvement approved by the City of Morro Bay. No abandoned vehicles of any nature shall be parked or stored on any Lot within this Development. Notwithstanding the foregoing, these restrictions shall not be interpreted in such a manner so as to permit any activity which would be contrary to any ordinance of the jurisdiction in which the Development is located.

(i) No windows shall be covered by paint, foil, sheets or similar items.

(j) No installation, construction or alteration of exterior improvements, including Front Yard Landscaping, may be undertaken on a Lot unless such installation, construction or alternation is in compliance with all applicable provisions of the Sea Shell Estates Design Manual set forth herein at Exhibit "C"

(k) No building or structure on any Lot shall be permitted to fall into disrepair and the landscaping thereon shall be maintained and kept adequately watered and weed free. Each such building and structure shall at all times be kept in good condition and repair and be adequately painted or otherwise finished. No Owner shall do any act or work that will impair the structural soundness of any building or the safety of the property. If any improvements on a Lot are damaged or destroyed by fire or any other calamity, the insurance proceeds shall be paid to the Owner of said Lot, or the Mortgagees thereof, as their respective interests may appear, and such Owner or Mortgagee shall use said proceeds to rebuild or repair the damage. In the event the Owner does not commence such rebuilding or repair within a reasonable period of time, any Owner may bring suit for an injunction to compel the Owner to perform the rebuilding or repair. Such a reasonable time shall be presumed to be no greater than one year.

(l) Each Owner of a Lot shall keep all shrubs and trees, grass and plantings of every kind on such Lot properly maintained, trimmed, fertilized and cultivated and free of trash and other unsightly material. Each Owner shall perform all necessary rodent control activities on his Lot.

(m) No Owner or occupant shall engage in activity within the Development which is in violation of any law, ordinance, statute, rule or regulation of any local, county, state or federal agency.

(n) Garages shall be used only for parking purposes and for the storing of household goods of Owners and occupants and for such other purposes as may be lawful so long as adequate clear space is maintained within the garage for the intended number of vehicles.

(o) No obstruction, diversion, bridging, pollution or confining of drainage courses or of existing channels through confining of drainage courses or of existing channels through which storm surface water naturally flows upon and across and Lot shall be made by any Owner in such a manner as to threaten or cause increased drainage to adjacent Lots. Any improvement or alteration of a Lot which would affect the drainage pattern established upon the initial grading of the Lot proposed to be improved or altered or the drainage pattern of any adjoining Lot shall be disapproved by the Architectural Review Committee and the City unless it can be specifically determined that alternative suitable drainage is provided in the improvement or alteration plans submitted by the Owner.

(p) No oil drilling, oil development operations, oil refining, quarrying, or mining operations of any kind shall be permitted on or in the Development; and no oil wells, tanks, tunnels and mineral excavations or shafts shall be permitted on the surface of the Development or within five hundred (500) feet below the surface of the Development. No derrick or other structure designed for use in boring for oil or natural gas shall be erected, maintained or permitted on the Development.

(q) No plants or seeds infected with noxious insects or plant diseases shall be brought upon, grown or maintained within the Development. Owners of Lots shall not be prohibited from planting and maintaining gardens or engaging in any other noncommercial farming activity on their individual Lots.

(r) None of the Lots shall be divided by subdivision map or parcel map.

3.3 Residential Use Only.

(a) No Lot shall be used except for residential purposes. No buildings shall be erected on any Lot except for one Single Family residence secondary unit or guest suite within 3,600 square feet – Building footprint, 2,000 square

feet private non-fenced area and 1,000 square feet private fenced yard.

(b) Outbuildings shall be within the Building Footprint or 1,000 square feet of fenced area and shall not be located in the unfenced or open areas pursuant to the Design Manual Guidelines. Outbuildings may include structures which are normally considered accessory to a Single Family residence such as workshops and studios. No portion of any Lot shall be used for any business, commercial or manufacturing purpose. No oil or mining operations shall be permitted on any Lot. No Lot may be used for the raising of livestock, fur bearing animals, fish, or poultry in any confined environment.

3.4 Mobile Homes and Vehicles. No mobile home, modular home or prefabricated home shall be placed on any Lot. No Lot Owner shall repair or service any Vehicle on any Lot except within an enclosed garage. No inoperative Vehicles shall be stored on any Lot unless stored within an enclosed garage.

3.5 External Fixtures. External Fixtures shall be consistent with the Design Manual, subject to the approval of the DRC in its sole discretion

3.6 Animals. No animals shall be kept on any Lot except for domestic dogs, cats or other animals kept inside a cage as household pets. No animal shall be kept on any Lot for any commercial purpose. No dogs shall be permitted on the Access Roads unless they are controlled by a leash. Lot Owners shall be responsible for any damages caused by their animals.

3.7 Trespass. No Lot Owner shall trespass upon the Open Space without the consent of the Owner(s) of the Open Space. No use of the Open Space Area shall be allowed which is inconsistent with the preservation and maintenance of the Open Space Areas.

3.8 Partition of Lots. No partition or further subdivision of any Lot shall be permitted.

3.9 Lawful Use. No noxious, offensive or unlawful activity shall occur on any Lot. No Lot Owner shall do anything on a Lot which is a nuisance to any Owner, or an annoyance to any Owner, such as playing amplified loud music, having noisy outdoor parties, or other similar activity that creates an audible annoyance lasting for an unreasonably extended period of time. No Lot Owner shall engage in activity on the Lot which is in violation of any law, ordinance, statute, rule or regulation of any local, county, state or federal body.

3.10 Development Impact Fees. Prior to issuance of a building permit for development of each Lot, such Lot Owner shall be responsible for paying the applicable City of Morro Bay development impact fees.

ARTICLE 4 – MAINTENANCE OBLIGATIONS

4.1 Use of Roads. Access to the Lots is over roads constructed upon the Open Space and portions of the Lots. These roads are the Access Roads identified on the Map. By the recordation of the Map, each Lot has been granted an easement over the Open Space and the Lots to use the Access Roads for ingress and egress to the Lots and Open Space and not for access to any other property, including property adjacent to the Lots, except by authorized emergency, police or fire vehicles, or in the event of an emergency evacuation. Parking shall be prohibited on the Access Roads at all times, except in designated parking areas.

4.2 Road and Entrance Maintenance. The maintenance of the Access Roads and Entrances shall be as set forth in this article.

4.3 Maintenance Of Roads, Drainage Areas and Open Space Areas.

4.3.1. Definitions. Capitalized terms used in this Article shall have the meanings set forth below. Any capitalized terms which are not defined below shall have the meaning given to them in Article 1 of these Declarations.

4.3.1.1 Annual Emergency Account Assessment. Each Owner's obligation to the funding of the Emergency Account in an annual amount of One Hundred Dollars ($100) (and pro-rata in the final year of such assessment) pursuant to Section 5.1

4.3.1.2 Annual Maintenance and Repairs. The Maintenance and Repairs to be performed each year, starting in or about October of the calendar year following completion of the construction of the Access Roads.

4.3.1.3 Assessment. The amount owed by each Owner as set forth in a statement sent to such Owner under Sections 4.3.4.3, 4.3.4.1, 4.3.5.1, 4.3.5.4, and 4.3.6.2 of this Declaration.

4.3.1.4 Developer. Seashell Estates, LLC, its successors and assigns.

4.3.1.5 Emergency Account. The account to be maintained as a separate account in a financial institution to be funded and used to pay for Emergency Maintenance and Repairs.

4.3.1.6 Emergency Maintenance and Repairs. Maintenance and Repairs which (a) arise from conditions or occurrences subsequent to the determination of the Annual Maintenance

and Repairs by the RMC, (b) are required to be performed during the year, and (c) the RMC has not planned or budgeted for in the Annual Maintenance and Repairs.

4.3.1.7 Legal Fees and Costs. The fees charged and other expenses incurred in connection with any legal action taken, or other legal consultation or work provided, pertaining to the Access Roads and Other Common Areas.

4.3.1.8 Lot Owner. Any person, persons or entity who owns a fee interest in Lots 1 through 10 of Final Vesting Map No. 2870.

4.3.1.9 Maintenance and Repairs. All work necessary to maintain in good condition, and to repair damage to the Access Roads, and Drainage Areas, Open Space including but not limited to, reviewing and evaluating and appraising conditions, filling chuckholes, repairing cracks, repaving, repairing and maintaining drainage system and structures, removing debris, maintaining retaining walls, maintaining slopes adjacent to roads, maintaining signs, markers and striping, maintaining the entrance gate and other work reasonably necessary or proper to evaluate, repair, maintain and preserve the Access Roads, Open Drainage Areas, and Open Space Areas. Maintenance and Repairs also includes legal work and insurance pertaining to the Access Roads and Other Common Areas, and Miscellaneous Expenses.

4.3.1.10 Majority Vote. When used in reference to a Vote by the Lot Owners, it shall mean six (6) or more of the Lot Owners' total Votes. When used in reference to a Vote by the Owners, it shall mean six or more of the total Votes of the Lot Owners.

4.3.1.11 Miscellaneous Expenses. The ongoing expenses of the Road Maintenance Committee for supplies, postage and other operating expenses desirable for that Committee to perform its functions.

4.3.1.12 Open Space Owner. Each Owner of a fee interest in the Open Space.

4.3.1.13 Other Common Areas. The Entrances, drainage infrastructure and conveyances, slopes and retaining walls adjacent to roadways on either side of the Access Roads, Drainage Area and Detention Basin, sewer, tract landscaping and sidewalks.

4.3.1.14 Owners. The Lot Owners and the Open Space Owner(s).

4.3.1.15 Representative. Each representative of the Lot Owners who comprise the Road Maintenance Committee.

4.3.1.16 RMC or Road Maintenance Committee. The three (3) member committee which, pursuant to this Declaration, will be responsible for the Maintenance and Repairs of the Access Roads and the Other Common Areas.

4.3.1.17 Road Maintenance Secretary. The Representative selected to perform certain tasks for the RMC as described in Section 4.3.2.8 below.

4.3.1.18 Send, Sending, Sent or Notify. In reference to the responsibility of the RMC to send statements and other correspondence to the Lot Owners and the Open Space Owner(s), it shall mean to mail such material to each Owner at the street address of his or her Lot or at such other address as the Owner may from time to time designate to the RMC in writing.

4.3.1.19 Vote. Consent or approval, whether written or oral.

4.3.1.20 Voting Interest. The number of Votes which the Lot Owners and the Open Space Owner(s) may cast pursuant to this Declaration. Each Lot Owner may cast one Vote for each Lot owned by him or her and each Open Space Owner may cast one Vote for each Lot of Open Space owned by him or her. The total number of Votes which may be cast by all the Owners is ten (10)

4.3.2 Road Maintenance Committee.

4.3.2.1 Responsibilities of the Road Maintenance Committee. The Lot Owners and the Open Space Owner(s) shall select Representatives to serve on the RMC pursuant to Section 4.3.2.3 below. The RMC shall be responsible for managing, contracting and making decisions concerning Maintenance and Repairs. Such responsibilities shall include, but not be limited to, obtaining estimates, budgeting, administering, preparing schedules, overseeing contracting, committing funds, assessing and paying for, on the account of the Lot Owners and the Open Space Owner(s), Annual and Emergency Maintenance and Repairs; communicating with the Lot Owners and the Open

Space Owner(s) with regard to the status of any legal action or other legal consultations or work pertaining to the Access Roads or Other Common Areas; and acquiring insurance, if available on reasonable terms, relating to the use of the Access Roads and Other Common Areas and the work of the RMC.

4.3.2.2 Limitations on the RMC. Notwithstanding the foregoing, the RMC shall not take any of the following actions without the approval of a Majority Vote of the Owners:

4.3.2.2.1 Any action that would make it impossible to carry out the responsibilities of the RMC;

4.3.2.2.2 Incur any obligation for Annual maintenance and Repairs above $25,000;

4.3.2.2.3 Incur any obligation for Emergency Maintenance and Repairs above $10,000;

4.3.2.2.4 Change the principal responsibilities of the RMC;

4.3.2.2.5 Commence and/or settle a lawsuit on behalf of the Owners; or

4.3.2.2.6 Agree to any settlement of any lawsuit or claim pertaining the Access Roads or Other Common Areas.

4.3.2.3 Selection of the Road Maintenance Committee. The Owners shall select Representatives to serve on the Road Maintenance committee as follows:

4.3.2.3.1 The Lot Owners, by a Majority Vote, shall elect two (2) Lot Owners to serve as Representatives on the RMC. The first election for the Lot Owners shall occur at the first annual meeting of the RMC. So long as the Developer owns at least three (3) Lots, the Developer may elect any person, whether or not he or she is a Lot Owner, to serve as a Representative. The Open Space Owner(s) shall choose one (1) Representative to serve on the RMC and such Representative need not be an Open Space Owner. The Open Space Owner(s) shall identify its Representative at or before the first annual RMC meeting, and at or before each subsequent meeting at which

Representatives are to be selected. In the event the Open Space Owner(s) cannot agree upon a Representative to serve on the RMC, each Open Space Owner (one per parcel of Open Space) shall propose a candidate for Representative and the two Representatives selected by the Lot Owners shall select the third Representative from such two candidates.

4.3.2.4 Term of Representation. Each Representative shall serve on the RMC until the occurrence of the second annual meeting after he or she was elected, except as follows:4.3.2.4.1 Any representative may resign at any time by giving written notice to the RMC;

4.3.2.4.2 A Representative elected by the Lot Owners shall be deemed to have resigned at the time that Representative no longer holds a fee interest in any Lot;

4.3.2.4.3 The Lot Owners may recall either or both of the Representatives elected by them, without cause, by a Majority Vote of the Lot Owners; and

4.3.2.4.4 The Open Space Owner(s) may recall the Representative it elected at any time without cause.

4.3.2.5 Replacement of Representatives. When a Representative's service terminates before the end of the two-year term for which he or she was elected, that Representative's replacement shall be elected to serve the remainder of that term in the same manner as described in Section 2.3.

4.3.2.6 Annual Meeting of the RMC. The RMC shall meet annually starting on April 15 of the calendar year following the year in which the Developer sold any Lot to an unrelated third party. All Owners shall be given thirty (30) days' prior written notice of the first annual meeting by the Developer and of each subsequent annual meeting by the RMC. The RMC shall choose the date and time of each subsequent annual meeting of the RMC. Each Owner shall be entitled to attend each annual meeting of the RMC and to cast his or her Vote on any matter set forth in Section 4.3.2.2 or 4.3.2.3 above. The agenda need not be sent to the Owners in advance of any annual meeting.

The agenda for each annual meeting of the RMC shall be determined by the RMC (or, in the case of the first annual meeting, by the Developer) and shall include, but shall not be limited to the following:

4.3.2.6.1 The election of Representatives, if any term has ended or if a vacancy exists for any Representative;

4.3.2.6.2 A presentation by the RMC of the status of the Maintenance and Repairs;

4.3.2.6.3 The opportunity for the Owners to ask questions of the RMC and for the RMC to respond to such questions; and

4.3.2.6.4 Other business properly before the RMC.

4.3.2.7 Other Meetings. The RMC shall hold other meetings at times to be fixed by the RMC. Such meeting shall be held at the discretion of the RMC, with or without notice to the Owners. No Vote of the Owners may be held at any meeting of the RMC unless notice of such meeting was given to the Owners entitled to Vote thereon at least thirty (30) days prior to the date of such meeting.

4.3.2.8 Communications with the RMC; Maintenance of Ledgers and Documents. The Representatives shall select one (1) Representative among them to act as RMC Secretary. The Secretary shall keep and maintain minutes of RMC meetings and all ledgers and documents required to be maintained by the RMC, and shall be responsible for sending, receiving and maintaining copies of all correspondence involving the RMC. Once selected, the Secretary shall notify the Owners that all correspondence from them to the RMC should thereafter be sent to the Secretary at the address or addresses designated by the Secretary.

4.3.3 Allocation of Costs for Maintenance and Repairs. Each Owner shall be responsible for paying one tenth (1/10th) of all costs associated with the Maintenance and Repair.

4.3.4 Annual Maintenance and Repairs.

4.3.4.1 Estimates. In or about June of each year, the RMC shall

determine the Annual Maintenance and Repair needs for that year by visually inspecting the Access Roads, drainage basin with associated underground chambers, common sewer and Other Common Areas and reviewing its records. The RMC shall then solicit bids and contract for the Annual Maintenance and Repairs for that year. The RMC shall make a good faith effort to schedule Annual Maintenance and Repairs to commence during the first week of October of that year. If the Annual Maintenance and Repairs do not exceed $25,000, the RMC need not seek the consent of the Owners before contracting for such Maintenance and Repairs. If, however, the Annual Maintenance and Repairs are estimated to exceed $25,000, the RMC shall so advise the Owners and request a Vote on whether or not to authorize the expenditures in excess of $25,000 before contracting for all of such Annual Maintenance and Repairs.

4.3.4.2 Annual Maintenance and Repair Records. The RMC Secretary shall note on a ledger that portion of the estimated expenses for the Annual Maintenance and Repairs attributable and chargeable to each Owner as an Assessment. The RMC Secretary shall maintain the ledger, which shall be open for inspection at reasonable times by each Owner or their authorized representatives. The ledger shall show for each Lot and Open Space, the name and address of the Owner of record thereof, all Assessments charged against each Lot and the Open Space, and the amount of such sums which have been paid or which remain outstanding.

4.3.4.3 Sending Statements for Annual Maintenance and Repairs. Within thirty (30) days after accepting bids for the Annual Maintenance and Repairs having a. cost of $25,000 or less, the RMC Secretary shall send to each Owner as statement of the amount of such Owner's allotted payment obligation for that year's Annual Maintenance and Repairs. If the RMC conditionally accepts bids for the Annual Maintenance and Repairs having- a cost of more than $25,000, the RMC Secretary shall send to each Owner a statement of the amount of such Owner's allotted payment obligation for that year's Annual Maintenance and Repairs based on a cost of $25,000 for the Annual Maintenance and Repairs.

4.3.4.4 Notification of and Voting on Need for Additional Funds; Sending Supplemental Statements. If the RMC determines that the cost for Annual Maintenance and Repairs will exceed $25,000, the RMC Secretary shall send to the Owners a statement of the estimated cost for Annual Maintenance and

Repairs and a request to Vote on the amount in excess of $25,000. The Vote may take place at a meeting of the RMC which is held at a stated date and time, which is not sooner than thirty (30) days after the statement is sent to the Owners, or by written approval on substantially the form included with the statement, which shall be effective as soon as the RMC receives a Majority Vote of the Owners delivered by hand delivery, mail, facsimile or e-mail. If the additional costs of Annual Maintenance and Repairs are approved, then the. RMC Secretary shall send a supplemental statement to each Owner as soon as possible after such approval, which shall include such Owner's allotted supplemental payment obligation for that year's Annual Maintenance and Repairs based on the cost for the Annual Maintenance and Repairs in excess of $25,000.

4.3.4.5 Payment of Estimates for Annual Maintenance and Repairs. The statements sent pursuant to Sections 4.3.4.3 and 4.3.4.4 above shall be due and payable within thirty (30) days of the date they were Sent, or on such later date or dates as the RMC may from time to time establish.

4.3.4.6 The RMC shall contract with a Civil Engineer licensed to practice in the State of California with experience in infrastructure maintenance to perform all inspections on the infrastructure. A copy of the inspection report shall be provided to the City of Morro Public Services Department for review.

4.3.5 Emergency Maintenance and Repairs.

4.3.5.1 Emergency Account. Concurrently with the delivery of the statement to Owners of their obligations with respect to Annual Maintenance and Repairs, as set forth in Section 4.3.4.3, the RMC shall send a statement to each Owner of its obligation of $100 for the funding of the Emergency Account (the "Annual Emergency Account Assessment"). Each Owner shall be responsible for an Annual Emergency Account Assessment for the period from the first Annual Maintenance and Repairs statement until the Emergency Account is funded in an amount of $10,000. All funds expended from the Emergency Account, up to $10,000, must be replenished by the Owners as set forth below.

4.3.5.2 Estimates for Emergency Maintenance and Repairs. The RMC shall obtain estimates and arrange for Emergency Maintenance and Repairs which cost up to $10,000 as they deem necessary.

Such costs may be paid by the RMC with funds in the Emergency Account.

4.3.5.3 Mailing Statements for Emergency Funds. Within thirty (30) days after the expenditure of any funds from the Emergency Account, the RMC Secretary shall send to each Owner a statement of the amount of such Owner's allotted payment obligation for such Emergency Maintenance and Repairs. If the RMC conditionally estimates that more than $10,000 in additional funding is necessary or convenient to have on hand in the Emergency Account for Emergency Maintenance and Repairs or determines to have Emergency Maintenance and Repairs undertaken which cost more than $10,000, the RMC Secretary shall send to each Owner a statement of the amount of such Owner's allotted payment obligation for such Emergency Maintenance and Repairs based on funding $10,000 in the Emergency Account.

4.3.5.4 Notification of and Voting on Need for Additional Funds; Sending Supplemental Statements. If the RMC estimates that more than $10,000 in additional funding is necessary or convenient to have on hand in the Emergency Account for Emergency Maintenance and Repairs or determines to have Emergency Maintenance and Repairs undertaken which cost more than $10,000, then the RMC Secretary shall send to the Owners a statement of the estimated cost to fund the Emergency Account or for Emergency Maintenance and Repairs, as the case maybe, and a request to Vote on the amount of either in excess of $10,000. The Vote may take place at a meeting of the RMC which is held at a stated date and time which is not sooner than thirty (30) days after the statement is sent to the Owners, or by written approval on substantially the form included with the statement, which shall be effective as soon as the RMC receives a Majority Vote of the Owners delivered by hand delivery, mail, facsimile or e-mail. If the additional funding of the Emergency Account is approved, then the RMC Secretary shall send a supplemental statement to each Owner as soon as possible after such approval, which shall include such Owner's allotted supplemental payment obligation for such funding of the Emergency Account in excess of $10,000.

4.3.5.5 Emergency Maintenance and Repair Records. The RMC shall maintain a ledger and other records relating to Emergency Maintenance and Repairs in a manner consistent with the record required for Annual Maintenance and Repairs in Section 4.2 above.

4.3.5.6 Payment of Estimates for Funding Emergency Account. The statements sent pursuant to Sections 5.3 and 5.4 above shall be due and payable within thirty (30) days of the date they were Sent, or on such later date or dates as the RMC may from time to time establish.

4.3.6 Legal Matters.

4.3.6.1 Estimates and Statements for Legal Fees and Costs. If the RMC, upon the Majority Vote of the Owners, hires legal counsel for any matter pertaining to the Access Roads or Other Common Areas, the RMC shall initially estimate the amount of the anticipated Legal Fees and Costs for the first three months of such legal work, including any retainer fee. From time to time thereafter, and as needed, the RMC shall make supplemental estimates for additional Legal Fees and Costs that will be necessary to fund such legal work. All fund collected for Legal Fees and Costs shall be deposited with counsel the RMC hires, to be held in such counsel's trust fund until applied for the payment of legal bills; provided that at any time the RMC may hold in an account in the name of the RMC any such sums which it reasonably believes will be paid to counsel, or refunded to the Owners, within sixty days.

4.3.6.2 Mailing Statements for Legal Fees and Costs. Within thirty (30) days of each estimate, the RMC Secretary shall send each Owner a statement of the amount of such Owner's allotted payment obligation for Legal Fees and Costs.

4.3.6.3 Records of Legal Action and other Legal Matters. The RMC shall maintain copies of all correspondence, records and bills received from legal counsel engaged by them for so long as any such matter is being actively pursued by such counsel and for a period of four years thereafter. All such records shall be open for inspection at reasonable times by each Owner or their authorized representatives, except that the RMC may deny access to such records to any Owner who is, or in the judgment of the RMC or counsel engaged by it, is likely to become an adverse party to the interest represented by the RMC during the pendency of such

matter.

4.3.6.4 Payment of Estimates for Legal Fees and Costs. The statements sent pursuant to Section 6.2 above shall be due and payable within thirty (30) days of the date they were Sent, or on such later date or dates as the RMC may from time to time establish.

4.3.6.5 Representative Actions. Any legal action pertaining to the Access Roads or Other Common Areas which the Owners authorize may only be brought in the name of the RMC as the representative of the interest of the Owners.

4.3.7 Insurance. The RMC is authorized to purchase the following types of insurance, if available, to be paid for as part of the expenses for the Annual Maintenance and Repairs:

4.3.7.1 General Liability Insurance. The RMC is authorized to acquire insurance indemnifying the Owners against liability and related legal expenses for injuries and damages allegedly arising from the use of the Access Roads and the Other Common Areas.

4.3.7.2 Directors and Officers Insurance. The RMC is authorized to acquire insurance indemnifying the RMC and the Representatives against liability and legal expenses for any claims of misfeasance or malfeasance against them.

4.3.8 Use of Funds Received. The RMC shall use the funds received pursuant to this Declaration only for their intended purposes. The RMC shall keep an account of all funds received by it and of all disbursements made therefrom.

4.3.9. Failure to Pay Assessments. Should any Owner fail to pay any Assessment, then the RMC may, in addition to exercising any other available remedy, send a notice to such Owner that his payment of one or more Assessments is delinquent and that failure to pay the delinquent amount within ten (10) days after the date of such notice (the "Delinquency Date") will subject the Owner to interest on such amount at the rate of ten percent (10%) per annum. If the Owner has not paid the delinquent amount by the Delinquency Date, interest will accrue on such amount from such date at the rate of ten percent (10%) per annum until the delinquent amount and accrued interest thereon is paid in full. If the Owner has not paid the delinquent amount by the Delinquency Date, in addition to the accrual of interest, the RMC may, at its, option, bring an action at law against the delinquent Owner personally obligated to pay the same in the manner now or hereafter provided in California Civil

Code Section 845. There shall be added to the delinquent amount and interest thereon all costs and expenses, including reasonable attorney fees incurred by the RMC in collecting the delinquent assessment. Nothing contained in this section shall be construed as limiting the remedies available to the Open Space Owner(s) or the Lot Owners for default by any Owner hereunder.

4.3.10 Professional Maintenance. All maintenance responsibilities, schedules, routines and standards, including roads, drainage, detention structures, Tract landscaping, and mitigation and monitoring of Open Space Easement Areas, shall be conducted under maintenance agreements with qualified professionals as set forth in Sections 5.10 and 5.11.

ARTICLE 5 – DESIGN REVIEW COMMITTEE

5.1 Organization. There shall be a Design Review Committee created to advise Lot Owners and ensure compliance with the Design Manual. The DRC shall consist of three (3) persons. The DRC shall include at least two technically trained persons from an architectural firm (one shall be a licensed architect) and one property Owner.

5.2 Designation of Members and Terms of Office.

5.2.1 Initial Members. The initial members of the DRC shall be appointed by Declarant. The Declarant shall designate said members prior to the conveyance of the first Lot to a Public Purchaser and shall provide each Owner with a list of the names of the DRC members. Each of said members shall serve for a term of two (2) years unless they have resigned or been removed from office and the terms of all DRC members appointed thereafter shall be one (1) year. Any new member appointed to replace a member who has resigned or been removed shall serve such member's unexpired term.

5.2.2 Appointment and Removal. The Declarant reserves to itself the power to appoint the members of the DRC until ninety percent (90%) of the Lots within Sea Shell Estates have been sold or until the fifth anniversary of the date of issuance of the original public report for Sea Shell Estates whichever occurs first. After one (1) year from the date of issuance of the original public report for Sea Shell Estates, the Declarant shall appointment one member to the DRC from the Owners of Lots within the Development.

5.2.3 Resignations. Any member or alternate member of the DRC may at any time resign from the Design Review Committee upon written notice

delivered to Declarant or to the Chairperson of the Design Review Committee, whichever then has the right to appoint members.

5.2.4 Vacancies. Vacancies on the DRC, however caused, shall be filled by the Declarant or the remaining members of the Design Review Committee, whichever then has the power to appoint members.

5.3 Duties. It shall be the duty of the DRC to consider and act upon such proposals or plans submitted to it pursuant to the terms hereof, to adopt DRC guidelines and to carry out all other duties imposed upon it by this Declaration.

5.4 Meetings. The DRC shall meet from time to time as necessary to properly perform its duties hereunder. The vote or written consent of any two {2) members shall constitute an act by the Design Review Committee unless the unanimous decision of its members is otherwise required by this Declaration. The DRC shall keep and maintain a record of all actions taken by it at such meeting or otherwise. The members of the DRC shall be entitled to reimbursement for reasonable expenses incurred by them in the performance of any Design Review Committee function.

5.6 Application for Approval of Improvements. Any Owner, except the Declarant and its designated agents, proposing to perform any work of any kind whatever which requires the prior approval of the DRC pursuant to this Declaration, shall apply to such Design Review Committee for approval by notifying the Design Review Committee of the nature of the proposed work with such information as the Design Review Committee may require, including but not limited to three (3) copies of (1) a plot plan of the Lot showing the location of all existing and proposed improvements (2) elevation drawings and (3) the Owner's proposed construction schedule. The DRC may require that the application for approval in connection with any improvement to be constructed be accompanied by an inspection fee in an amount not to exceed five hundred dollars ($500.00) in the event that the Design Review Committee deems that outside consultants are necessary to review plans or otherwise inspect the proposed improvements.

5.7 Basis for Approval of Improvements. The DRC shall grant the requested approval only if:

(1) The Owner shall have strictly complied with the provisions of Section 5.6 above; and

(2) The DRC shall find that the plans and specifications conform to this Declaration, and to the DRC Rules in effect at the time such plans were submitted to such DRC and

(3) The members of the Design Review Committee in their sole discretion determine that the proposed improvements would be compatible with the design and aesthetic standards of Sea Shell Estates and the purposes of this Declaration as to location with respect to topography, finished grade elevations and other Design Manual standards.

5.8 Form of Approval. All approvals given under paragraph 5.7 shall be in writing PROVIDED, HOWEVER, that any request for approval which has not been rejected within sixty (60) days from the date of submission thereof to the DRC shall be deemed approved.

5.9 Proceeding with Work. Upon receipt of approval from the Design Review Committee pursuant to paragraph 5.8 above, the Owner shall, as soon as practicable, submit to the City for necessary approvals and permits. After City approvals and issuance of permits, the Owner shall satisfy all conditions thereof and diligently proceed with the commencement and completion of all installations/ construction, grading and excavations pursuant to said approval. Said commencement to be within six months from the date of such approval.

If the Owner shall fail to comply with this paragraph 5.9 any approval given pursuant to paragraphs 5.7 and 5.8 shall be deemed revoked unless the Design Review Committee, upon written request of the Owner made prior to the expiration of said commencement periods, extends the time for such commencement. No such extension shall be granted except upon a finding by the Design Review Committee that there has been no change in the circumstances upon which the original approval was granted.

5.10 Failure to Complete Work. The Owner shall in any event complete the installations, construction, grading and excavations of any improvements within eighteen (18) months after commencing the work on all improvements except, and for so long as, such completion is rendered impossible or would result in great hardship to the Owner due to strikes, fires/ national emergencies, natural calamities or other supervening forces beyond the control of the Owner or his agents. If Owner fails to comply with this paragraph, the Design Review Committee shall notify the Owner of such failure, and the Design Review Committee shall proceed in accordance with the provisions of paragraph 5.11 below as though the failure to complete the improvement were a noncompliance with approved plans.

5.11 Inspection of Work. Inspection of work and correction of defects therein shall proceed as follows:

5.11.1 Upon the completion of any construction of any improvements, or upon the completion of any other work for which approved plans are required under this Article, the Owner shall be given written notice thereof to the Design Review Committee.

5.11.2 Within sixty (60) days thereafter the Design Review Committee, or its duly authorized representatives, may inspect such improvement to determine whether it was installed, constructed, reconstructed, altered or refinished to substantial compliance with the approved plans. If the Design Review Committee finds that such work was not done in substantial compliance with the approved plans, it shall notify the Owner

in writing of such noncompliance within such sixty (60) days period, specifying particulars of noncompliance and shall require the Owner to remedy such noncompliance.

5.11.3 If upon the expiration of thirty (30) days from the date of such notification, the Owner shall have failed to remedy such noncompliance, the Design Review Committee shall set a date on which a hearing before the Design Review Committee shall be held regarding the alleged noncompliance. The hearing date shall be not more than thirty (30) days nor less than fifteen (15) days after notice of the noncompliance is given to the Owner by the Committee. Notice of the hearing date shall be given at least ten (10) days in advance thereof by the Design Review Committee to the Owner, and in the discretion of the Committee, to any other interested party.

5.11.4 At the hearing, the Owner, the DRC and, in the Design Review Committee's discretion, any other interested person may present information relevant to the question of the alleged noncompliance. After considering .all such information, the Design Review Committee shall determine whether there is a noncompliance and, if so, the nature thereof and the estimated cost of correcting or removing the same. If a noncompliance exists, the Committee shall require the Owner to remedy or remove the same within a period of not more than forty-five (45) days from the date of the Design Review Committee ruling. If the Owner does not comply with the Design Review Committee's ruling within such period or within any extension of such period as the Design Review Committee, in its discretion may grant, the Design Review Committee, at its option, may take legal action.

5.11.5 If for any reason the Committee fails to notify the Owner of any noncompliance within sixty (60) days after receipt of said notice of completion from the Owner, the improvement shall be deemed to be in accordance with said approved plans.

5.12 Waiver. The approval by the DRC of any plans, drawings or specifications for any work done or proposed, or for any other matter requiring the approval of the Design Review Committee under these Restrictions, shall not be deemed to constitute a waiver of any right to withhold approval of any similar plan, drawing, specification or matter subsequently submitted for approval.

5.13 Estoppel Certificates. Within thirty (30) days after written demand is delivered to the DRC by any Owner, the Design Review Committee shall prepare and deliver an estoppel certificate, executed by any two (2) of its members, certifying (with respect to any Lot of said Owner) that as of the date thereof either (a) all improvements made and other work done upon or within said Lot comply with this Declaration, or (b) such

improvements or work do not so comply in which event the certificate shall also identify the noncomplying improvements or work and set forth with particularity the basis of such noncompliance. Any purchaser from the Owners, or from anyone deriving any interest in said Lot through him, shall be entitled to rely on said certificate with respect to the matters therein set forth, such matters being conclusive as between the Declarant and all Owners and such persons deriving any interest through them.

5.14 Liability. Neither the DRC nor any member thereof shall be liable to the RMC or to any Owner for any damage, loss or prejudice suffered or claimed on account of (a) the approval or disapproval of any plans, drawings and specifications, whether or not defective, (b) the construction or performance of any work, whether or not pursuant to approved plans, drawings and specifications, (c) the development of any property within Sea Shell Estates or (d) the execution and filing of an estoppel certificate pursuant to Section 5.14, whether or not the facts therein are correct; PROVIDED, HOWEVER, that such member has acted in good faith on the basis of such information as may be possessed by him. Without in any way limiting the generality of the foregoing, the Design Review Committee, or any member thereof, may, but is not required to, consult with or hear the views of any Owner with respect to any plans, drawings, specifications or any other proposal submitted to the Committee.

ARTICLE 6 – ARCHITECTURAL CONTROL

Construction of all improvements on the Lots shall be in accordance with the following provisions and the provisions of the Design Manual attached hereto as Exhibit "C".

6.1 Architectural Approval. No single-family residence, detached garage, outbuilding, landscaping or fencing shall be erected on any Lot, or any modifications thereto be made for which a building permit is required, without Plans being submitted to the DRC and the prior approval of such Plans having been obtained from the DRC. Approval shall be based upon conformity with the Covenants Conditions and Restrictions, the Conditions of Approval, the Design Manual, and such other Rules as may be adopted by the DRC. The design review process shall require (1) a letter of Approval from the Design Review Committee demonstrating the consistency with the architectural Sea Shell Estates Design Manual prior to submittal of the Precise Plan to the City; and (2) City of Morro Bay Planning Commission approval in accordance with the Sea Shell Estates Design Manual. Colors and materials, including fencing materials shall be as approved on the exhibits to the Design Manual. All other colors and materials not so specifically approved may be approved by the Director of Public Services according to the following objectives: achieve compatibility with colors and materials used in the on-site improvements; achieve compatibility with the architectural design of the improvements; achieve compatibility with surrounding land uses and properties; and

preserve the character and integrity of the Development. If any Lot Owner shall take any action without the prior written approval of the DRC when such approval is required, then the DRC or any other Owner may, at their option, bring an action at law or in equity against such Lot Owner for injunctive relief or damages, including the damages that would be incurred by the DRC or any other Owner to remove any structure or modification, or repair any damages caused thereby erected without such prior written consent. It is specifically acknowledged that a failure to comply with the requirements to obtain the prior written consent of the DRC will cause the DRC and the other Owners irreparable harm and that any remedies at law available to them will be inadequate and will not fully compensate them from the damage done. Accordingly, the DRC or any other Owner may obtain both injunctive or temporary relief without the necessity of proving actual damages in addition to other remedies they may have.

6.2 Waiver. The approval by the DRC of any Plans for work done or proposed, or for any other matter requiring the approval of the DRC shall not be deemed to constitute a waiver of any right to withhold approval of any similar Plan subsequently submitted for approval.

6.3 Building Envelopes. The maximum developable area for each Lot as set forth in the definition of Building Envelope and shall be a maximum of 6,600 square feet consisting of a 3,600 square foot Building Footprint, a 1,000 square foot fenced area, and 2,000 square feet of unfenced area.

6.4 Building Footprint. Building Footprint including garage shall not exceed three-thousand-six-hundred (3,600) square feet including allowed outbuildings.

6.5 Private Yard Fenced Areas. In each lot of The Sea Shell Estates, portions of individual lots may be designated as "Private Fenced Yard" areas. The private area shall be for the exclusive use of the Owner. A maximum fenced area of one-thousand (1,000) square feet is allowed but shall be placed on the north side of the home as to be enshrouded from the view of Highway 1. Fences, retaining walls, decks, patios, walkways and landscaping are permitted in these areas. No play structures and storage is to exceed the height of any fence

6.6 Private Yard Non-Fenced Areas (Within the Building Envelope). In each Lot of The Sea Shell Estates, portions of individual Lots may be designated as "Private non-fenced yard" areas. The Private non-fenced yard area shall be for the exclusive use of the Lot Owner. A maximum of 2,000 square feet of area may be used for landscape, retaining walls, uncovered above grade decks, patios, stairs and landings and walkways, and this area shall be integral and adjacent to the house. The remaining area of the Building Envelope shall be left close to its existing natural environmental state. Landscaping, stepped low retaining walls, uncovered at grade decks, patios, stairs, landings, and walkways (not to exceed thirty inches (30") in height) are permitted in these areas and shall be an integral part of the Open Space area. All landscaping shall adhere to the Design Manual's approved Plant Palette. Fences are not allowed. Parking, Play structures

and storage are not allowed.

6.7 Setbacks. The City of Morro Bay Zoning Ordinance establishes setback lines from the property line however in this case; the minimum setback for each Lot shall be the Building Envelope as defined in this Declaration.

The front yard setback will be twenty (20) feet minimum measured from the back of street paving for each Lot. The side yard setbacks for each Lot shall be those shown on the Final Map. The rear setbacks vary for each Lot as shown on the Final Map. See attached Exhibit "A" for individual rear setback locations.

6.8 Transfer of Remaining Area Within The Development Limit Line. As required by the Conditions of Approval for Tract No. 2870 by the City of Morro Bay, once the 6,600 square foot Building Envelope has been approved by the City, the remaining area within the Development Limit Line shall be transferred into the open space easement area and subject to the use restrictions on such areas. The remaining area shall be transferred by each Owner including a legal description describing the area or other documentation acceptable to the City of Morro Bay which shall be recorded prior to the City of Morro Bay issuing a Building Permit for that Lot.

6.9 Guest Parking. Any Guest Parking shall be only in designated areas per Sea Shell Estates Design Manual Section 5.7.

6.10 Residential Use. No more than one residence shall be constructed on any Lot; except for a secondary housing unit or "guest suite" as long as it is an integral part of the main residence and not a separate structure.

6.11 Open Space Easement. The Open Space Easement as set forth on the Final Vesting Map No. 2870, including the additions thereto set forth in Section 5.8, above, shall be set aside for permanent protection, restricted in perpetuity and shall contain no development, improvements or landscaping other than natural vegetation except for disturbance in connection with the subdivision improvements shown on the Final Improvement Plans. Any disturbance of the Open Space easement in connection with said subdivision improvements shall be restored if necessary consistent with the approved Biological Mitigation Plan attached as Exhibit D hereto and as required by the Conditions of Approval. This work shall be completed prior to the acceptance of the subdivision improvements by the City of Morro Bay.

An Open Space Easement over each Lot shall be shown on the Final Map and as established pursuant to Section 5.8. The maintenance responsibility for the Open Space easement shall be by the Road Maintenance Committee (RMC). Any maintenance shall be consistent with the approved Biological Mitigation Plan and attached to this Declaration as Exhibit D. Maintenance in the Open Space easement areas will be performed by or under the direction of a qualified professional biologist. In the event that the Open Space Easement area is not maintained by the Owners of the individual

Lots or the RMC, then the City shall have the authority to require such maintenance and provide thirty (30) days notice to the Lot Owner and the RMC of any specific defects in the maintenance of the Open Space.

Any changes and/or modifications to the Open Space Easement shall be reviewed and approved by the City of Morro Bay prior to any modifications.

6.12 Other Common Area. The maintenance of the Other Common Area shall be the responsibility of the Road Maintenance Committee (RMC). All maintenance other than ordinary landscaping within the Other Common Area shall be performed by a licensed contractor qualified to do the maintenance work.

6.13 Herbicide Use within the Building Envelope. Herbicide use within the Building Envelope shall be restricted to environmental friendly varieties.

6.14 Herbicide Use within the Open Space Easement. The use of chemical herbicides within the Open Space easement is prohibited as required by the Conditions of Approval.

6.15 Grading and Drainage. After the construction of the improvements authorized by the Conditions of Approval and as part of the Final Improvement Plans, grading shall not occur outside the Building Envelope with the exception of grading required for entry drives to each Lot. Drainage within each Lot shall be directed away from the Open Space and toward the tract drainage system for collection in the detention basin, to the extent practicable unless otherwise allowed by the City Engineer.

ARTICLE 7 – GENERAL PROVISIONS

7.1 Interpretation: Inconsistency. The provisions of this Declaration shall be liberally construed to effectuate its purpose of creating a uniform plan for the Development for the mutual benefit of all Owners.

7.2 Severability. The provisions herein shall be deemed independent and severable, and the invalidity or partial invalidity or unenforceability of any of the provisions hereof shall not affect the validity of the remaining provisions.

7.3 Enforcement Waiver. Any Owner shall have the right to enforce, by any proceeding at law or in equity, all restrictions, conditions, covenants and reservations imposed by the provisions of this Declaration. Failure by any Owner to enforce any covenant or restriction herein contained shall in no event be deemed a waiver of the right to do so thereafter. All landscaping, fencing and structures throughout the Project shall maintain continued consistency with the plans approved by the City, unless otherwise approved by the Planning Commission or Planning Staff.

7.4 Binding on Successors. This Declaration shall be binding upon, and shall inure to the benefit of, the successors and assigns of Declarant, and the heirs, personal representatives, grantees, lessees, sublessees, contract purchasers, guests and assignees of the Owners.

7.5 Attorney's Fees. In any action whatsoever arising from rights and obligations established under this Declaration, including but not limited to actions for damages resulting from a breach of this Declaration or actions for specific enforcements hereof, the prevailing party shall be entitled to recover such reasonable sum as the court may fix as attorney's fees, costs and expenses, which costs and expenses shall not be limited to "taxable costs", but shall include all costs and expenses reasonable incurred by the prevailing party.

7.7 Leases. No Owner is permitted to lease his Residence for transient or hotel purposes. Any lease of a Residence shall provide that the lease is subject to all respects the provisions of this Declaration. Such lease shall further provide that any failure by the lessee to comply with the terms of such document shall be a default under the lease. All leases and rental agreements of Units shall be in writing and shall be for a term of thirty (30) days or more.

ARTICLE 8 – DURATION AND AMENDMENT

8.1 Term. The provisions contained herein shall run with the land and shall be binding on all parties and all persons claiming under them until fifty (50 years from the date hereof, after which time this Declaration shall be deemed automatically extended for successive periods of ten (10) years unless an instrument executed by a majority of the Owners of Lots within the Development shall be recorded, canceling and terminating this Declaration.

8.2 Amendment. Upon issuance of written approval by the City, this Declaration may be amended or terminated in whole or part as all or any part of the Development by a written instrument duly executed by the following and recorded in the Office of the County Recorder of San Luis Obispo County:

(a) As to all or any part of the Development at the time all is owned by Declarant, such amendment may be executed by Declarant;

(b) After the sale of the first Lot in the Development, such amendment shall be executed by the following:

[i] Declarant; and

[ii] A fifty-one percent (51%) majority of the Owners of Lots other than Declarant.

(c) After the sale of all Lots in the development, such amendment shall be executed by a fifty-one percent (51%) majority of the Owners of Lots other than Declarant.

8.3 City Approval Required for Certain Amendments. Notwithstanding any other provision of this Declaration, no amendment, change, modification, or termination of the conditions, covenants and restrictions of this Declaration regarding the following provisions shall be effective for any purpose until approved in writing by the Director of Planning and Building of the City of Morro Bay.

IN WITNESS WHEREOF, the foregoing instrument was subscribed the day and year first above written.

Seashell Estates, LLC

By: _____
Seashell Estates LLC
Robert J. Zinngrabe
Member/Manager

Name Printed: ROBERT J ZINNGRABE

Date: 1-14-14

Exhibit "A"
Final Vesting Map No. 2870

OWNER'S STATEMENT

WE, THE UNDERSIGNED, HEREBY CERTIFY THAT WE ARE ALL THE OWNERS OF, AND ALL RECORD HOLDERS OF SECURITY INTEREST IN, AND ALL PARTIES HAVING ANY RECORD TITLE IN THE REAL PROPERTY INCLUDED WITHIN THE SUBDIVISION AND PROJECT SHOWN ON THIS MAP, AND THAT EACH OF US DOES HEREBY CONSENT TO THE FILING AND/OR RECORDATION OF THIS MAP.

WE HEREBY RESERVE TO OURSELVES, OUR HEIRS, AND ASSIGNS CERTAIN PRIVATE EASEMENTS FOR SEWER, OPEN SPACE, ACCESS, AND DRAINAGE FOR THE USE AND BENEFIT OF THE PRESENT OR FUTURE OWNERS OF LOTS 1 THROUGH 10 AFFECTED BY SUCH EASEMENTS AS DELINEATED ON SAID MAP.

WE HEREBY RESERVE TO OURSELVES, OUR HEIRS, AND ASSIGNS CERTAIN PRIVATE EASEMENTS FOR USE AND BENEFIT OF THE PUBLIC UTILITY COMPANY WHICH IS AUTHORIZED TO SERVE IN SAID SUBDIVISION, EASEMENTS FOR PUBLIC WATER PURPOSES, DELINEATED ON SAID MAP AS "PUBLIC WATER EASEMENT".

WE HEREBY RESERVE TO OURSELVES, OUR HEIRS, AND ASSIGNS CERTAIN PRIVATE EASEMENTS FOR USE AND BENEFIT OF THE SEVERAL PUBLIC UTILITY COMPANIES WHICH ARE AUTHORIZED TO SERVE IN SAID SUBDIVISION, EASEMENTS FOR PUBLIC UTILITY PURPOSES, DELINEATED ON SAID MAP AS "PUBLIC UTILITY EASEMENT", OR "P.U.E."

WE HEREBY DEDICATE TO THE PUBLIC FOR PUBLIC USE TERESA DRIVE AND PUBLIC WATER EASEMENT AS SHOWN ON SHEET 3 OF THIS MAP.

SEASHELL ESTATES, LLC, A CALIFORNIA LIMITED LIABILITY COMPANY

BY: _____

ROBERT J. ZINNGRABE, MEMBER / MANAGER

ACKNOWLEDGMENT

STATE OF CALIFORNIA

COUNTY OF _____

ON _____ BEFORE ME, _____,
PERSONALLY APPEARED _____

WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/SHE/THEY EXECUTED THE SAME IN HIS/HER/THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS/HER/THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND.

_____ COMMISSION NO.: _____
SIGNATURE OF NOTARY PUBLIC

COUNTY OF: _____

_____
PRINTED NAME COMMISSION EXPIRES: _____

ACKNOWLEDGMENT

STATE OF CALIFORNIA

COUNTY OF _____

ON _____ BEFORE ME, _____,
PERSONALLY APPEARED _____

WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/SHE/THEY EXECUTED THE SAME IN HIS/HER/THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS/HER/THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND.

_____ COMMISSION NO.: _____
SIGNATURE OF NOTARY PUBLIC

COUNTY OF: _____

_____
PRINTED NAME COMMISSION EXPIRES: _____

N:\2009\09061-Seashell\Survey\Drawings\TM09061.dwg, SHEET 1, Jan 03, 2014 12:33pm, Randy

CITY CLERK'S STATEMENT

I, DO HEREBY STATE THAT THE CITY COUNCIL OF THE CITY OF MORRO BAY, STATE OF CALIFORNIA, DID, ON

_____, 201___, APPROVE THIS MAP OF TRACT 2870 SHOWN HEREON IN ACCORDANCE WITH THE PROVISIONS OF THE SUBDIVISION MAP ACT AND THE OFFERS OF DEDICATION SHOWN HEREON FOR
_____ WERE REJECTED WITHOUT PREJUDICE AS TO FUTURE ACCEPTANCE. THE OFFER OF DEDICATION OF PUBLIC WATER EASEMENT IS HEREBY ACCEPTED.

_____ _____
JAMIE BOUCHER, CITY CLERK OF THE CITY OF MORRO BAY *DATED*
COUNTY OF SAN LUIS OBISPO
STATE OF CALIFORNIA

BENEFICIARY SIGNATURE

COAST NATIONAL BANK,

1. *AS BENEFICIARY UNDER A DEED OF TRUST RECORDED OCTOBER 1, 2013, AS INSTRUMENT NO. 2013-056471 OF OFFICIAL RECORDS OF SAN LUIS OBISPO COUNTY, CALIFORNIA.*

BY: _____
SIGNATURE

PRINT NAME AND TITLE: _____

ACKNOWLEDGMENT

STATE OF CALIFORNIA

COUNTY OF _____

ON _____ BEFORE ME, _____,
PERSONALLY APPEARED _____

WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/SHE/THEY EXECUTED THE SAME IN HIS/HER/THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS/HER/THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND.

_____ COMMISSION NO.: _____
SIGNATURE OF NOTARY PUBLIC

COUNTY OF: _____

_____
PRINTED NAME COMMISSION EXPIRES: _____

SURVEYOR'S STATEMENT

THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECTION AND IS BASED ON A FIELD SURVEY IN CONFORMANCE WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCE AT THE REQUEST OF _____ IN _____. I HEREBY STATE THAT THIS FINAL MAP SUBSTANTIALLY CONFORMS TO THE CONDITIONALLY APPROVED TENTATIVE MAP. I ALSO HEREBY STATE THAT THE MONUMENTS ARE OF THE CHARACTER AND AND OCCUPY THE POSITIONS INDICATED, OR THAT THEY WILL BE SET IN THESE POSITIONS WITHIN ONE YEAR OF COMPLETION OF THE IMPROVEMENTS AND THAT THE MONUMENTS ARE, OR WILL BE, SUFFICIENT TO ENABLE THIS SURVEY TO BE RETRACED.

LICENSED LAND SURVEYOR
JAMES RANDAL ELLISON
LIC. NO. 7065
STATE OF CALIFORNIA

_____ _____
JAMES RANDAL ELLISON L.S. 7065 *DATED*
EXP. 12-31-14

CITY ENGINEER'S STATEMENT

I HEREBY STATE THAT I HAVE EXAMINED THE ANNEXED MAP, THAT THE SUBDIVISION SHOWN HEREON IS SUBSTANTIALLY THE SAME AS IT APPEARED ON THE APPROVED TENTATIVE MAP AND ANY APPROVED ALTERATIONS THEREOF, AND THAT ALL PROVISIONS OF THE SUBDIVISION MAP ACT AND AND THE APPLICABLE ORDINANCES OF THE CITY OF MORRO BAY HAVE BEEN COMPLIED WITH AND THAT I AM SATISFIED THAT THIS MAP IS TECHNICALLY CORRECT.

_____ _____
ROBERT ALAN LIVICK, LS 8126, EXP 12/31/14 *DATED*
CITY ENGINEER, CITY OF MORRO BAY, CALIFORNIA

COUNTY RECORDER'S STATEMENT

FILED THIS _____ DAY OF _____, 201__ AT _____ __.M. IN BOOK _____ OF MAPS, AT PAGE _____, AT THE REQUEST OF RANDY ELLISON.

DOCUMENT NO: _____

FEE: _____

SIGNED: _____ *BY:*
_____
COUNTY RECORDER *DEPUTY*

RECORDER'S DISCLAIMER

THE TABULATION, LISTING AND NUMBERING OF ANY SEPARATE DOCUMENTS AUTHORIZED TO BE RECORDED CONCURRENTLY WITH THIS MAP HAVE BEEN PROVIDED BY THE SUBDIVIDER OR BY THE LOCAL AGENCY APPROVING THE MAP. THE COUNTY RECORDER MAKES NO REPRESENTATIONS REGARDING THE ACCURACY OR THE TABULATION, LISTING AND NUMBERING OF ANY SEPARATE DOCUMENTS REFERRED TO ON THIS MAP.

NOTE: THE FOLLOWING DOCUMENTS AFFECTING THE PROPERTY DENOTED HEREON ARE BEING RECORDED CONCURRENTLY HEREWITH:

1) CONDITIONS, COVENANTS AND RESTRICTIONS, PER DOC. NUMBER 201__-_____
2) NOTICE OF REQUIREMENTS, PER DOC. NUMBER 201__-_____

UNPLOTTABLE EASEMENTS

THERE EXIST CERTIAN UNPLOTTABLE EASEMENTS AFFECTING THIS PROPERTY:

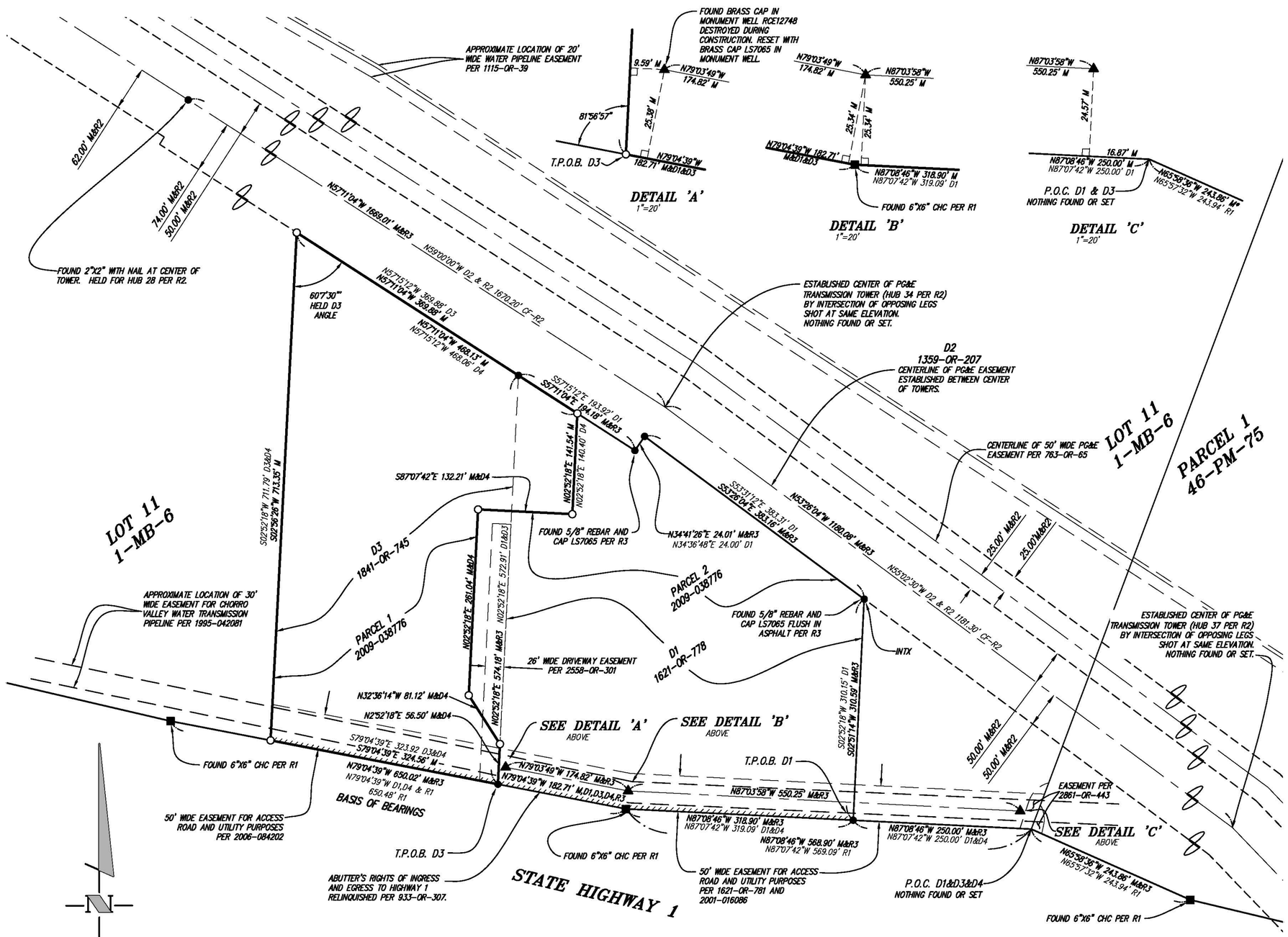
1. *674-OR-515: WATER PIPE LINE EASEMENT*
2. *713-OR-1: WATER PIPE LINE EASEMENT*
3. *2010-058444: NONEXCLUSIVE INSTALLATION AND SERVICE AGREEMENT*

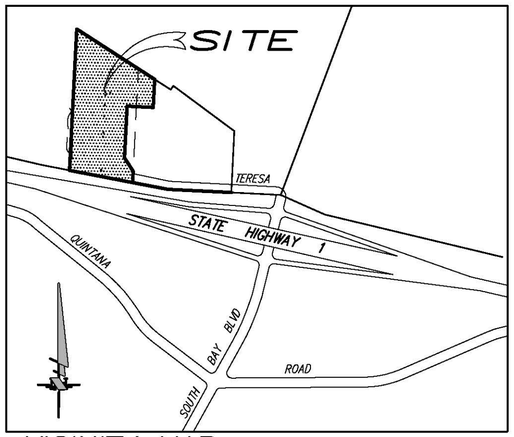
ABOVE GRADE ENGINEERING
1304 Broad Street, San Luis Obispo, CA 93401
phone:(805) 540-5115 • fax:(805) 540-5116
A California Corporation • Scott Stokes PE # 58256

CERTIFICATE SHEET
TRACT 2870
SEASHELL ESTATES

BEING A SUBDIVISION OF PARCEL 1 OF LOT LINE ADJUSTMENT MBAL-08-0159 OF A PORTION OF LOT 11 PER BOOK 1 OF MAPS AT PAGE 6
CITY OF MORRO BAY
COUNTY OF SAN LUIS OBISPO, STATE OF CALIFORNIA

SEPTEMBER, 2012 JOB NO.09061 SHEET 1 OF 4 SHEETS





VICINITY MAP

NO SCALE

LEGEND

- ○ SET 5/8" REBAR WITH CAP "L.S. 7065"
- ◒ SET COTTON SPINDLE AND SUPERTAG "L.S. 7065"
- ▲ FOUND BRASS CAP MONUMENT IN WELL RCE12748 NO RECORD
- △ SET BRASS CAP IN WELL "L.S. 7065"
- ● FOUND 1" I.D. PIPE WITH PLASTIC PLUG "L.S. 7065" PER R3 UNLESS NOTED OTHERWISE
- M MEASURED
- R_ RECORD
- FND FOUND
- FTC. FROM TRUE CORNER
- INTX. BEARING/BEARING INTERSECTION CALCULATION

REFERENCES

D1 – 1621-OR-778
D2 – 1359-OR-207
D3 – 1841-OR-745
D4 – 2009-038776
R1 – CAL TRANS ROW MAPS SLO-001-27.7 AND 28.2
R2 – PG&E TRANSMISSION MAP, DRAWING NUMBER 207378 SHEET 2 OF 13
R3 – 101-RS-91

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS SURVEY WAS TAKEN FROM THE NORTHERLY RIGHT-OF-WAY OF STATE HIGHWAY 1 BETWEEN FOUND CHC MONUMENTS AS SHOWN HAVING A BEARING OF NORTH 79°04'39" WEST PER R1.

ABOVE GRADE ENGINEERING
1304 Broad Street, San Luis Obispo, CA 93401
phone:(805) 540-5115 • fax:(805) 540-5116
A California Corporation • Scott Stokes PE # 58236

BOUNDARY
TRACT 2870
SEASHELL ESTATES

BEING A SUBDIVISION OF PARCEL 1 OF LOT LINE ADJUSTMENT MBAL-08-0159 OF A PORTION OF LOT 11 PER BOOK 1 OF MAPS AT PAGE 6
CITY OF MORRO BAY
COUNTY OF SAN LUIS OBISPO, STATE OF CALIFORNIA

SEPTEMBER, 2012 JOB NO.09061 SHEET 2 OF 4 SHEETS

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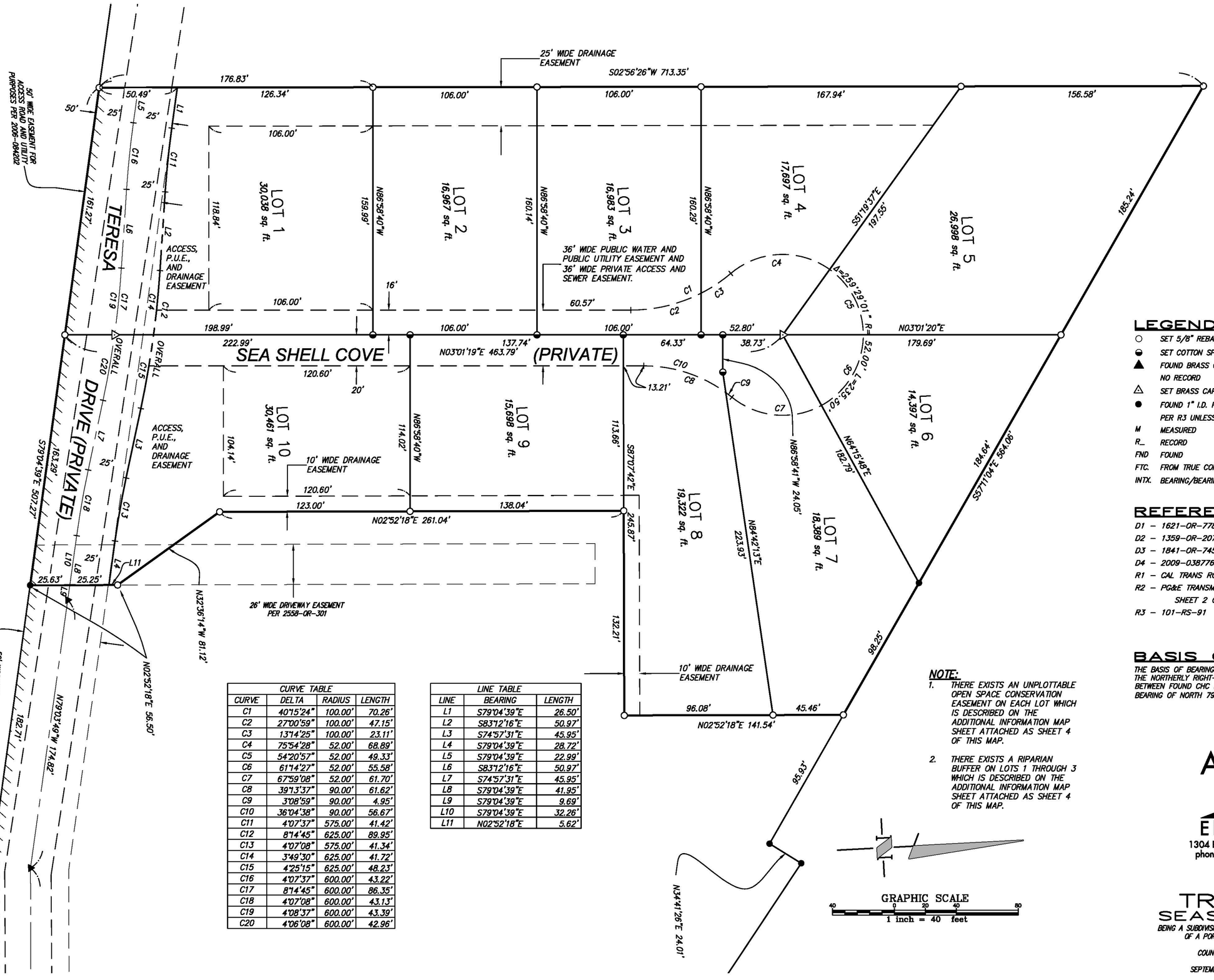

CURVE TABLE			
CURVE	DELTA	RADIUS	LENGTH
C1	40°15'24"	100.00'	70.26'
C2	27°00'59"	100.00'	47.15'
C3	13°14'25"	100.00'	23.11'
C4	75°54'28"	52.00'	68.89'
C5	54°20'57"	52.00'	49.33'
C6	61°14'27"	52.00'	55.58'
C7	67°59'08"	52.00'	61.70'
C8	39°13'37"	90.00'	61.62'
C9	3°08'59"	90.00'	4.95'
C10	36°04'38"	90.00'	56.67'
C11	4°07'37"	575.00'	41.42'
C12	8°14'45"	625.00'	89.95'
C13	4°07'08"	575.00'	41.34'
C14	3°49'30"	625.00'	41.72'
C15	4°25'15"	625.00'	48.23'
C16	4°07'37"	600.00'	43.22'
C17	8°14'45"	600.00'	86.35'
C18	4°07'08"	600.00'	43.13'
C19	4°08'37"	600.00'	43.39'
C20	4°06'08"	600.00'	42.96'

LINE TABLE		
LINE	BEARING	LENGTH
L1	S79°04'39"E	26.50'
L2	S83°12'16"E	50.97'
L3	S74°57'31"E	45.95'
L4	S79°04'39"E	28.72'
L5	S79°04'39"E	22.99'
L6	S83°12'16"E	50.97'
L7	S74°57'31"E	45.95'
L8	S79°04'39"E	41.95'
L9	S79°04'39"E	9.69'
L10	S79°04'39"E	32.26'
L11	N02°52'18"E	5.62'

LEGEND

- ○ SET 5/8" REBAR WITH CAP "L.S. 7065"
- ◒ SET COTTON SPINDLE AND SUPERTAG "L.S. 7065"
- ▲ FOUND BRASS CAP MONUMENT IN WELL RCE12748 NO RECORD
- △ SET BRASS CAP IN WELL "L.S. 7065"
- ● FOUND 1" I.D. PIPE WITH PLASTIC PLUG "L.S. 7065" PER R3 UNLESS NOTED OTHERWISE
- M MEASURED
- R_ RECORD
- FND FOUND
- FTC. FROM TRUE CORNER
- INTX. BEARING/BEARING INTERSECTION CALCULATION

REFERENCES

D1 – 1621-OR-778
D2 – 1359-OR-207
D3 – 1841-OR-745
D4 – 2009-038776
R1 – CAL TRANS ROW MAPS SLO-001-27.7 AND 28.2
R2 – PG&E TRANSMISSION MAP, DRAWING NUMBER 207378 SHEET 2 OF 13
R3 – 101-RS-91

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS SURVEY WAS TAKEN FROM THE NORTHERLY RIGHT-OF-WAY OF STATE HIGHWAY 1 BETWEEN FOUND CHC MONUMENTS AS SHOWN HAVING A BEARING OF NORTH 79°04'39" WEST PER R1.

NOTE:

1. THERE EXISTS AN UNPLOTTABLE OPEN SPACE CONSERVATION EASEMENT ON EACH LOT WHICH IS DESCRIBED ON THE ADDITIONAL INFORMATION MAP SHEET ATTACHED AS SHEET 4 OF THIS MAP.
2. THERE EXISTS A RIPARIAN BUFFER ON LOTS 1 THROUGH 3 WHICH IS DESCRIBED ON THE ADDITIONAL INFORMATION MAP SHEET ATTACHED AS SHEET 4 OF THIS MAP.

ABOVE GRADE ENGINEERING
1304 Broad Street, San Luis Obispo, CA 93401
phone:(805) 540-5115 • fax:(805) 540-5116
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LOT DATA
TRACT 2870
SEASHELL ESTATES

BEING A SUBDIVISION OF PARCEL 1 OF LOT LINE ADJUSTMENT MBAL-08-0159 OF A PORTION OF LOT 11 PER BOOK 1 OF MAPS AT PAGE 6
CITY OF MORRO BAY
COUNTY OF SAN LUIS OBISPO, STATE OF CALIFORNIA

SEPTEMBER, 2012 JOB NO.09061 SHEET 3 OF 4 SHEETS

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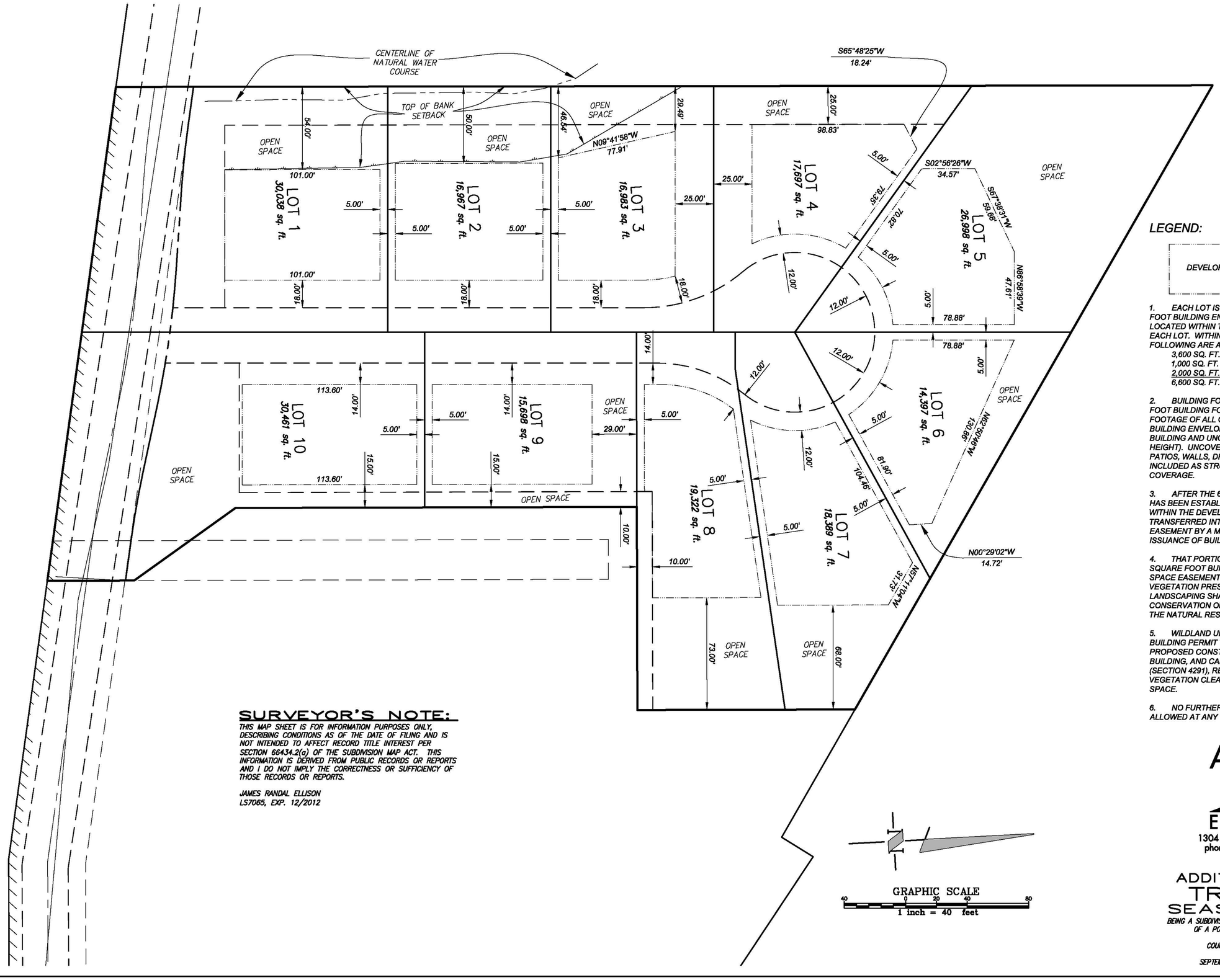

SURVEYOR'S NOTE:

THIS MAP SHEET IS FOR INFORMATION PURPOSES ONLY, DESCRIBING CONDITIONS AS OF THE DATE OF FILING AND IS NOT INTENDED TO AFFECT RECORD TITLE INTEREST PER SECTION 66434.2(a) OF THE SUBDIVISION MAP ACT. THIS INFORMATION IS DERIVED FROM PUBLIC RECORDS OR REPORTS AND I DO NOT IMPLY THE CORRECTNESS OR SUFFICIENCY OF THOSE RECORDS OR REPORTS.

JAMES RANDAL ELLISON
LS7065, EXP. 12/2012

LEGEND:

DEVELOPMENT LIMIT LINE

1. EACH LOT IS LIMITED TO A MAXIMUM 6,600 SQUARE FOOT BUILDING ENVELOPE. THIS ENVELOPE IS TO BE LOCATED WITHIN THE DEVELOPMENT LIMIT LINE SHOWN FOR EACH LOT. WITHIN EACH ENVELOPE A MAXIMUM OF THE FOLLOWING ARE ALLOWED:
   - 3,600 SQ. FT. BUILDING FOOTPRINT
   - 1,000 SQ. FT. FENCED AREA, AND
   - 2,000 SQ. FT. UNFENCED AREA.
   - 6,600 SQ. FT. TOTAL

2. BUILDING FOOTPRINT DEFINITION: THE 3,600 SQUARE FOOT BUILDING FOOTPRINT IS THE CUMULATIVE SQUARE FOOTAGE OF ALL COVERED STRUCTURES WITHIN THE BUILDING ENVELOPE (IE. HOME, GARAGE, ACCESSORY BUILDING AND UNCOVERED DECKS OVER 30 INCHES IN HEIGHT). UNCOVERED DECKS UNDER 30 INCHES IN HEIGHT, PATIOS, WALLS, DRIVEWAYS AND WALKWAYS ARE NOT INCLUDED AS STRUCTURES AS IT PERTAINS TO LOT COVERAGE.

3. AFTER THE 6,600 SQUARE FOOT BUILDING ENVELOPE HAS BEEN ESTABLISHED ON EACH LOT, THE REMAINING AREA WITHIN THE DEVELOPMENT LIMIT LINE SHALL BE TRANSFERRED INTO THE OPEN SPACE CONSERVATION EASEMENT BY A METHOD APPROVED BY THE CITY, PRIOR TO ISSUANCE OF BUILDING PERMIT.

4. THAT PORTION OF EACH LOT OUTSIDE THE 6,600 SQUARE FOOT BUILDING ENVELOPE IS TO BE AN OPEN SPACE EASEMENT WITH USES RESTRICTED TO NATURAL VEGETATION PRESERVATION. ANY GRADING OR CULTIVATED LANDSCAPING SHALL BE PROHIBITED FROM THE CONSERVATION OPEN SPACE AREA IN ORDER TO PROTECT THE NATURAL RESOURCES.

5. WILDLAND URBAN INTERFACE: PRIOR TO ISSUANCE OF BUILDING PERMIT THE OWNER SHALL DEMONSTRATE THAT PROPOSED CONSTRUCTION WILL COMPLY WITH FIRE, BUILDING, AND CALIFORNIA PUBLIC RESOURCES CODE (SECTION 4291), RELATIVE TO BUILDING CONSTRUCTION, VEGETATION CLEARANCE / MANAGEMENT AND DEFENSIBLE SPACE.

6. NO FURTHER SUBDIVISION OF THESE LOTS SHALL BE ALLOWED AT ANY TIME.

ABOVE GRADE ENGINEERING
1304 Broad Street, San Luis Obispo, CA 93401
phone:(805) 540-5115 • fax:(805) 540-5116
A California Corporation • Scott Stokes PE # 58256

ADDITIONAL MAP SHEET
TRACT 2870
SEASHELL ESTATES

BEING A SUBDIVISION OF PARCEL 1 OF LOT LINE ADJUSTMENT MBAL-08-0159
OF A PORTION OF LOT 11 PER BOOK 1 OF MAPS AT PAGE 6
CITY OF MORRO BAY
COUNTY OF SAN LUIS OBISPO, STATE OF CALIFORNIA

SEPTEMBER, 2012 JOB NO.09061 SHEET 4 OF 4 SHEETS

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Exhibit "B"
Vesting Tentative Tract Map (S00-062), Conservation Subdivision, Conditional Use Permit (UPO-138), Coastal Development Permit (CPO-207)

City of Morro Bay

Morro Bay, CA 93442 • 805-772-6200
www.morro-bay.ca.us

VESTING TENTATIVE TRACT MAP CONSERVATION SUBDIVISION, CONDITIONAL USE PERMIT, COASTAL DEVELOPMENT PERMIT

CASE NO: Vesting Tentative Subdivision Map SOO-062/ Conditional Use Permit UPO-138/ Coastal Development Permit CPO-207

THIS PERMIT IS HEREBY APPROVED AND ISSUED FOR:

SITE ADDRESS: 1305 Teresa

APPLICANT: New Life Trust - Cathy Novak, agent

APN: 068-411-008

LEGAL: A resubdivision of Portion of Lot 11 of Rancho San Bernardo; COC 2006084201

DATE APPROVED: June 15, 2009

APPROVED BY: PLANNING COMMISSION

APPROVED BASED UPON ATTACHED FINDINGS *(Findings and Conditions of Approval Attached)*

CEQA DETERMINATION: MITIGATED NEGATIVE DECLARATION

DESCRIPTION OF APPROVAL: Vesting Tentative Subdivision Map SOO-062/ Conditional Use Permit Precise Plan UPO-138/Coastal Development Permit CPO-207, for a custom residential 10 lot conservation subdivision and open space easement on 4.7 acres.

THIS APPROVAL IS CONDITIONAL AND IS VALID *ONLY IF CONDITIONS (ATTACHED) ARE MET* AND *ONLY AFTER THE APPLICABLE APPEAL PERIOD. Failure to comply with the conditions of this permit shall, at the discretion of the Public Services Director pursuant to Municipal Code Section 17.60.150, render this entitlement null and void.*

PERMIT EFFECTIVE DATE & INFORMATION APPLICABLE TO YOUR PROJECT IS OUTLINED FOLLOWING THE BOX CHECKED BELOW:

X **YOUR PROPERTY IS LOCATED IN THE CITY OF MORRO BAY JURISDICTION, THERE IS AN APPEAL PERIOD OF TEN (10) *Calendar days*, WITHIN WHICH TIME YOUR PERMIT IS APPEALABLE TO THE CITY COUNCIL**

☐ **YOUR PROPERTY IS LOCATED IN THE COASTAL COMMISSION APPEALS JURISDICTION.** This City decision is appealable to the California Coastal Commission pursuant to the California Public Resource Code, Section 30603. The applicant or any aggrieved person may appeal this decision to the Coastal Commission within TEN (10) *Working days* following Commission receipt of this notice. Appeals must be in writing and should be addressed to: California Coastal Commission, 725 Front Street, Ste. 300, Santa Cruz, CA 95060, Phone: 408-427-863. If you have any questions, please call the City of Morro Bay Public Services Department, 772-6261.

IF NOT APPEALED, YOUR PERMIT WILL BE EFFECTIVE: June 26, 2009

ATTEST: Aileen Nygaard **DATE: June 23, 2009**

Aileen Nygaard, Associate Planner
FOR: Bruce Ambo, Public Services Director

THIS IS A DISCRETIONARY APPROVAL AND DOES NOT CONSTITUTE A BUILDING PERMIT

City of Morro Bay

Morro Bay, CA 93442 • 805-772-6200
www.morro-bay.ca.us

EXHIBIT A

FINDINGS FOR APPROVAL

For Precise Plan Conditional Use Permit, Coastal Development Permit, and Vesting Tentative Tract Map , SOO-062/UPO-138/CPO-207

California Environmental Quality Act (CEQA)

A. That for purposes of the California Environmental Quality Act, Case No. SOO-062/UPO-138/CPO-207 has an adopted Mitigated Negative Declaration, April 13, 2009.

Precise Plan Conditional Use Permit and Coastal Development Permit Findings

B. That the project is an allowable use in its zoning district and is also in accordance with the certified Local Coastal Program and the General Plan for the City of Morro Bay based on the analysis; and

C. The establishment, maintenance, or operation of the use applied for will not be detrimental to the health, safety, morals, comfort and general welfare of the persons residing or working in the neighborhood of such proposed use as the project is consistent with all applicable zoning and plan requirements; and

D. The use will not be injurious or detrimental to property and improvements in the neighborhood or the general welfare of the City since the project, as conditioned, will be conducted consistent with all applicable City regulations.

Conservation Subdivision Findings

E. Modification of development standards is warranted to promote orderly and harmonious development.

F. Modification of development standards will enhance the opportunity to best utilize special characteristics of an area and will have a beneficial effect on the area.

G. The proposed project meets the purpose and intent of Conservation subdivisions to preserve open space within residential developments; minimize the environmental and visual impacts of new development on critical natural resources and historically and culturally significant sites and structures; provide an interconnected network of permanent open space; encourage a more efficient form of development that consumes less open land and conforms to existing topography and natural features; reduce erosion and sedimentation by minimizing land disturbance and removal of vegetation; enhance the community character; permit clustering of houses and structures which will reduce the amount of infrastructure.

Subdivision Map Act Findings

H. The proposed Vesting Tentative Tract Map to create ten residential lots and an open space easement, where the new parcels will have single-family residences that are consistent with the General Plan and Coastal Land Use Plan because residential development including design manual and **draft** CC&Rs have been developed to guide the homes construction and the given parcel sizes are allowed under the land use designation and zoning & subdivision ordinance.

I. The site is physically suitable for the type and density of development proposed because the site is zoned for suburban residential development and after considering the environmental constraints the pattern of conservation subdivision for ten residential lots provides a reasonable fit to the site and still complies with the land use designation.

J. The design of the subdivision and related improvements will not cause substantial environmental damage or substantially and avoidably injure fish or wildlife or their habitat because all precautions will be implemented to catch and direct all runoff.

K. The design of the subdivision and improvements will not cause serious public health problems.

L. The design of the subdivision and related improvements will not conflict with easements, acquired by the public at large, for access through or use of, property within the proposed subdivision because no easements are required for the public.

M. As conditioned, the design, architectural treatment, and general appearance of all buildings and open space areas will be in keeping with the character of the surrounding area pursuant to 17.48.200, and will not be incompatible with the uses permitted in the surrounding areas and zoning district.

N. The City has available adequate water to serve the proposed subdivision based upon the water regulations and water equivalency table Exhibit A, enforced at the time of approval of the Vesting Tentative Parcel Map pursuant to the certified Water Management Plan and General Plan LU-22.1.

REVISED EXHIBIT B
CONDITIONS OF APPROVAL AS REVISED PER CITY COUNCIL
For Concept Plan approval of SOO-062/UPO-138/CPO-207

STANDARD CONDITIONS

1. This Conditional Use /Concept Plan permit is granted for the use as described in the staff report and the on plans received by the Public Services Department, ("Exhibit C" of the staff reports). The conceptual Tentative Tract Map 2870 dated March 25, 2009 is granted approval. The approval is modified, however, by the following Conditions of Approval:

2. Inaugurate Within Two Years: If the approved use is not established within two (2) years of the effective date of this approval, this approval will automatically become null and void. However, upon written request by the applicant prior to the expiration date of this approval, up to two (2) one-year time extensions may be granted. Said extensions may be granted by the Public Services Director, upon finding that the project complies with all applicable provisions of the Morro Bay Municipal Code, General Plan and Local Coastal Program Land Use Plan (LCP) in effect at the time of the extension request.

3. Changes: Minor changes to the project description and/or conditions of approval shall be subject to review and approval by the Public Services Director. Any changes to this approved permit determined not to be minor by the Director shall require the filing of an amendment subject to Planning Commission review.

4. Compliance with the Law: All requirements of any law, ordinance or regulation of the State of California, City of Morro Bay, and any other governmental entity shall be complied with in the exercise of this approval. This project shall meet all applicable requirements under the Morro Bay Municipal Code, and shall be consistent with all programs and policies contained in the certified Coastal Land Use Plan and General Plan for the City of Morro Bay.

5. Hold Harmless: The applicant, as a condition of approval, hereby agrees to defend, indemnify, and hold harmless the City, its agents, officers, and employees, from any claim, action, or proceeding against the City as a result of the action or inaction by the City, or from any claim to attack, set aside, void, or annul this approval by the City of the applicant's project; or applicants failure to comply with conditions of approval. This condition and agreement shall be binding on all successors and assigns.

7. Compliance with Conditions: The applicant's establishment of the use and/or development of the subject property constitutes acknowledgement and acceptance of all Conditions of Approval. Compliance with and execution of all conditions listed hereon shall be required prior to obtaining final building inspection clearance. Deviation from this requirement shall be permitted only by written consent of the Public Services Director and/or as authorized by the Planning Commission. Failure to comply with these conditions shall render this entitlement, at the discretion of the Director, null and void. Continuation of the use without a valid entitlement will constitute a violation of the Morro Bay Municipal Code and is a misdemeanor.

8. Utility Services: All water and sewer impact fees shall be paid at the time the building permit

is issued.

9. Property Line Verification. It is owner's responsibility to verify lot lines. Prior to foundation inspection the lot corners shall be staked and setbacks marked by a licensed professional.

10. Park In-lieu Fee. Prior to recordation of the Final Map requirements of the City of Morro Bay for dedication of land for park purposes and/or payment of fee-in-lieu thereof shall be met (MBMC Section 16.13.005).

PUBLIC WORKS CONDITIONS

10. Sewer Master Plan Impact Fee: Prior to the issuance of a building permit, the Applicant/Developer shall pay to the City an impact fee toward the construction of municipal sewer improvements as determined by the Engineering Division in accordance with the Sewer System Master Plan.

11. Tract Map: $1,100 fee. The City Master Fee Schedule requires the Applicant/Developer pay a Tract Map Fee of $1,100 + direct costs for checking, inspection, and other provided work performed by contracted engineering services. The final map shall be furnished on Mylar and in electric format. The files need to be in the format of .dwg or .dxf. PDFs are not required but may be submitted in addition to confirm record of original drawings. The Applicant/Developer shall submit a current title report.

12. Public Improvements: $404 Plan Check Fee + additional costs. Public Improvements are required as set forth in MBMC Section 14.44.

13. Public Improvement & Grading Plans Submittal: The Public Improvement Plans shall be titled as such shall and submitted to the Engineering Division of the Public Services Department. The Improvement plans shall be separate of the Grading Plans. The Grading, Drainage, and Retaining Wall Plans shall be submitted to the Building Department for their approval and issuance of a "Grading or Building Permit".

14. Erosion and Sedimentation Control Plan: The Tentative Map shall make reference to control measures for protection against erosion of adjacent property and prevent sediment or debris from entering adjacent properties, waterway, or ecologically sensitive area. Such control also serves as an aid in meeting the National Pollutant Discharge Elimination System (NPDES) Permit Program as Authorized by the Clean Water Act and administered by the State of California. The Plan shall be approved by the City prior to building permit issuance.

PLANNING CONDITIONS

15. Archaeology: In the event of the unforeseen encounter of subsurface materials suspected to be of an archaeological or paleontological nature, all grading or excavation shall immediately cease in the immediate area, and the find should be left untouched until a qualified

professional archaeologist or paleontologist, whichever is appropriate, is contacted and called in to evaluate and make recommendations as to disposition, mitigation and/or salvage. The developer shall be liable for costs associated with the professional investigation and implementation of any protective measures as determined by the Director of Public Services.

16. Building Envelopes ~~shall be~~ shown on the Final Map at a maximum of ~~5,600~~ 6,600 square feet **shall be attributed to a 3,600 square foot building footprint, a 1,000 square foot fenced area, and 2,000 square foot unfenced area.**

17. Open Space Easement shall be recorded on the final map with uses restricted to natural vegetation preservation. Cultivated landscaping shall be prohibited from the **conservation** open space area in order to protect the natural resources.

18. Covenants, Codes and Restrictions (CC&Rs) and design manual shall be submitted with the final Tract Map for review and approval by planning staff and the City Attorney. An easement over each lot will also be provided for the common open space area. The Tract Map, easement and CC&Rs shall clearly indicate the common open space area. The CC&Rs shall include clear provisions for the continued maintenance of the common open space area and shall include provisions for the City to force maintenance of common area if the owners of the parcels fail to do so voluntarily. CC&Rs shall also restrict all landscaping, fencing and buildings throughout the project to continued consistency with plans hereby approved, unless otherwise approved by the Planning Commission or staff. CC&R's shall include, but not be limited to:

    a. Site Design :
        ~~i.~~ Setback requirements shall be: Side yard 5' minimum from property line, front yard 20'minimum measured from back of paving, and rear yard **as shown on the March 25, 2009 map.** ~~defensible space 30' minimum from building envelope lot line (20' exception for lots 9and 10).~~
        ~~ii.~~ Stream setbacks for lots 1-3 shall be 50' from top of bank or riparian vegetation.
        iii. Lighting shall be shielded and downcast to not provide glare.
        iv. Parking on site for guests shall be provided within the building envelope.
        v. Fencing limited to within building envelope with same height limitations as per City codes.

    b. Open Space:
        i. Open Space easement: no development or landscape other than natural vegetation is to be located within the open space easement.

    c. Grading and Drainage:
        i. Grading shall not occur outside the building envelope with the exception of grading required for entry drives. Drainage shall be directed away from **conservation** open space **to the extent practable as per City Engineering** and toward the street for collection in the detention basin.

d. Building Design:
   i. Building height shall be a maximum of 18'-6" calculated **as in the Design Manual document** ~~by City standards~~ and no more than two stories. Second stories shall be limited to 75% of footprint.
   ii. Massing, size, foundations, color, and character shall be compatible with the surrounding neighborhood and rural setting.
   iii. Passive solar systems and other energy saving design are encouraged.

e. Landscape palettes: fenced private area and unfenced private transition area shall not include invasive species or trees over 18'-6". Only natural existing vegetation is permitted with the **conservation** open space easement.

f. Fire Management:
~~Locate 30' defensible zone from structures within building envelope, 70' fire management practices located within open space easement as determined by the fire department and qualified biologist.~~ Individual lots shall meet fire codes for setbacks, building, and maintenance standards for wildland interface.

g. Maintenance:
   i. Provision for an HOA or similar entity to hold responsibility for maintenance of common areas.
   ii. Maintenance responsibilities, schedules, routine and standards, and fee sharing shall be established in the maintenance agreements. Agreements shall include provisions to maintain all common facilities by qualified professionals including roads, drainage and detention structures, tract landscaping, and mitigation and monitoring for conservation areas.

19. Colors and Materials: Prior to issuance of a building permit, the Planning and Building Director shall ensure compliance of all exterior colors and materials, including fencing materials as approved on the attached Exhibit(s). All other colors and materials not so specifically approved may be approved by the Director according to the following objectives: achieve compatibility with colors and materials used in the on-site improvements; achieve compatibility with the architectural design of the improvements; achieve compatibility with surrounding land uses and properties; preserve the character and integrity of the zone.

20. Undergrounding of Utilities: Pursuant to MBMC Section 17.48.050, prior to final occupancy clearance, all on-site utilities including electrical, telephone and cable television shall be installed underground.

21. Common Driveway Access and Maintenance: An easement or covenant consistent with Section 17.44.030 E shall be recorded for all parcels to have access to the common driveway

and backing areas over parcels to allow for access to the parking provided. The easement or covenant shall include the responsibilities of maintaining the roadway.

22. Landscape and Irrigation Plan: Prior to the issuance of a building permit, a final tract landscaping plan, prepared and stamped by a licensed Landscape Professional, (i.e., Landscape Architect, Architect, or Landscape Contractor) shall be submitted for review and approval by the Director of Public Services in accordance with all requirements of Section 17.48.290 of the MBMC. Said plan shall be consistent with the preliminary landscape plan and include a planting plan showing the species, number, size, and location of all plant materials. An irrigation plan shall include the proposed method and location of irrigation. Native and/or drought tolerant plant and tree species shall be used to the maximum extent feasible. **Street** trees shall be selected from the Master City Street Tree List prepared by the Public Works Department. The landscape plans shall also include fencing details.

23. Timing of Landscaping: Prior to issuance of a final Certificate of Occupancy or final grading or public improvements, all required tract plantings, groundcover and irrigation systems shall be in place to the satisfaction of the Director of Public Services. The landscape consultant shall provide a watering schedule and certify that all plantings and irrigation systems have been installed pursuant to the approved plans prior to issuance of the final Certificate of Occupancy.

24. Maintenance of Landscaping: All required plant materials shall be maintained in accordance with the watering schedule as specified in the approved landscape plan notes. All landscaping shall be cared for, maintained, watered, pruned and kept in a healthy growing condition for the life of the project. Where required plant(s) have not survived, it shall be promptly replaced with new plant materials of similar species, functional, size, and characteristics as specified in the approved landscape plant notes.

25. Conditions of Approval on Building Plans: Prior to the issuance of a Building Permit, the final Conditions of Approval shall be attached to the set of approved plans. The sheet containing Conditions of Approval shall be the same size as other plan sheets and shall be the last sheet in the set of Building Plans.

~~26. The applicant is required to pay the Department Fish and Game fee for a Negative Declaration filing of No Effect Finding along with a fee of to the County Clerk. The funds shall be made payable to the "County of San Luis Obispo" and delivered to the Public Services Department within five days of the approval. The funds will be forwarded along with the Environmental Determination to the County Clerk in accordance with California Code of Regulation Title 14, Division 1, Subdivision 3, Chapter 4, Section 753.5. Filing the Notice of Determination along with the fee is required within 10 days of the project approval and has the effect of starting a 30-day statute of limitations period for challenges to the decision in place of 180-day period otherwise in effect.~~

ENVIRONMENTAL CONDITIONS

SUMMARY OF MITIGATION MEASURES

Aesthetics

1. No structure shall obstruct or silhouette the ridgeline when viewed from the Highway.
2. The materials and house colors shall blend with the hillside so that future homes do not dominate the view or cause attention to them.
3. The building envelopes shall be as small as possible and protection of the natural vegetation and riparian habitat preserved to greatest extent.

Biological Resources

1. A pre-construction survey by a qualified biologist shall occur prior to development on each of the lots and/or issuance of a coastal permit to determine if bunchgrass community or special status plant species exist on the property.

2. If bunchgrass community, Blochman's dudleya, Cambria Morning glory, or other special status plant species are determined to be found onsite, then mitigation shall be as follows for any loss of habitat, one to one replacement or preservation of these habitats onsite shall be required and an onsite mitigation and monitoring program shall be determined by a qualified biologist, and shall include fire management provisions.

3. To reduce the potential harm to the adjacent serpentine bunchgrass and riparian habitat development of the proposed home sites shall be limited in the landscape palette to non-invasive exotic species and landscape planting within the building envelopes only.

4. To protect the riparian habitat, the following measures are required:

   a. Minimize the building envelopes. Impacts to native vegetation shall be calculated prior to development permits and utilized to determine mitigation requirements by a qualified biologist.

   b. A 50' setback from top of bank of natural drainage shall be implemented on Lots 1-3.

   c. Minimize impact to the riparian vegetation as much as possible. Ensure that riparian habitat adjacent to construction areas are protected during project construction by implementing protective measures such as marking the area with construction fencing. Any loss to riparian habitat shall be mitigated by developing a restoration plan. The restoration plan may consist of: enhancement of degraded portions of the onsite intermittent stream.

   d. Prevent grading equipment from crossing, depositing excavated material in or otherwise disturbing, the stream channel. Equipment shall be stored and refueled within designated areas located and/or designed to avoid impact to creeks or tributaries.

e. Apply mulching, seeding or other suitable soil stabilization measures to protect exposed critical areas from erosion as soon as feasible after final grading.

f. Implement soil erosion control plan with Best Management Practices (BMP's).

5. The following mitigation measures shall reduce construction related impacts to less than significant:

a. To ensure that the project does not impact nesting migratory birds or special status birds, construction should be performed between June15 and October 15. If construction cannot be conducted during this time or extends beyond this time frame, a pre-construction survey shall be conducted to ensure that birds are not nesting in the work area. If special status birds are nesting in the work area, the work shall be delayed until the chicks have fledged and left.

b. To ensure that the project does not impact ground nesting birds, construction should be performed between August 15 and March 15. If construction cannot be conducted during this time or extends beyond this time frame, a pre-construction survey shall be conducted to ensure that birds are not nesting in the work area. If special status birds are nesting in the work area, the work shall be delayed until the chicks have fledged and left.

c. Fire Management: Weed mowing and construction activities should be restricted to be performed between August 15th and March 15th in order to avoid nesting birds. Weed mowing between March 15th and August 15th to avoid impacts to the Cambria Morning Glory should be cut no shorter than 6 inches. Mowing during this time requires a nesting bird survey performed by a qualified biologist within 100' of the work area. If no birds are present within this area work, may proceed.

d. The area to be disturbed by development shall be shown on a site plan. The area in which grading is to occur shall be defined on-site by readily identifiable barriers that will protect the intended and surrounding native habitat areas.

e. The boundaries of the project and equipment access routes shall be minimized and clearly demarcated by flagging or other means to prevent workers or equipment from inadvertently straying from the project area. The number of access routes, number and size of staging areas, and the total area of activity shall be limited to the minimum necessary to achieve the project goals.

f. Heavy equipment and other machinery shall be cleaned when necessary to reduce the risk of introducing any weedy species into the project area.

Geology/Soils

1. The applicant shall provide project-specific soils and geotechnical reports required by the Building Official. Project design and construction shall be consistent with recommendations contained in soils and geology reports, as required by the Building Official. This report shall consider alternatives to foundation design other than slab-on-

grade. The goal would be to minimize cut and fill operation, loss of habitat mitigated by other sections to be preserved to greatest extent possible, maintaining the lowest profile and roof heights as possible.

Hazards/Hazardous Materials

1. The City Engineer shall review and approved the typical drive sections on plans for compliance with City standards.
2. Two fire hydrants shall be installed along the southern side of the private road and cul-de-sac proposed as required by the Fire Department.
3. The applicant understands that at the time of building construction fire sprinklers shall be required in the new buildings.
4. The applicant shall work with the Fire Department to meet the intent of the code requirement to buffer around the structures.

Hydrology/Water Quality

1. Apply for a grading permit and prepare plans that will protect water quality by reducing the discharge of pollutants (such as siltation to the maximum extent practicable) and satisfies the appropriate water quality requirement of the Clean Water Act.
2. Individual house plans and site development plans shall, to the maximum extent possible, limit impervious surfaces and direct all runoff in accordance with City standards to the detention basin. Evaluation of the detention basin capacity shall occur prior to tract improvements.

Land Use/Planning

1. The applicant shall pay the in-lieu-housing mitigation fee of 20% of the estimated construction cost for a typical house design on one of the lots. (Maximum size ~~3600 sqft @ $200 per/sqft = $720,000 X 20% = $144,000~~ ~~6,300 sqft @ $150 per/ sqft = $945,000 X 20% = $189,000~~ **3,600 sf @ $150 per /sf = $540,000 x 20% = $108,000**).

2. The prior mitigation set in the Geology; Biology and Aesthetic sections shall be followed to be consistent with policies.

Noise

1. Project construction within 500 feet of any existing residences shall be limited to the hours of 7 a.m. to 7 p.m. on weekdays and 8 a.m. to 7 p.m. on weekends. All large construction equipment will be equipped with "critical" grade noise mufflers. Engines will be tuned to insure lowest possible noise levels. Back up "beepers" will also be tuned to insure lowest possible noise levels. All necessary measures to muffle, shield or enclose construction equipment shall be implemented in order to insure that noise levels at the property line of the nearest parcels do not exceed 75 dBA.

Public Services

1. The Developer shall pay a pro-rata fair share to the City as an impact fee toward the

construction of municipal sewer improvements as determined by the Engineering Division in accordance with the Water and Sewer System Master Plan.

Recreation

1. Park in-lieu fees are required to be paid by the Subdivision Ordinance in an amount calculated as established in that ordinance.

Transportation/Circulation

1. Traffic impact fees shall be paid proportionate to the net percentage increase in peak hour traffic flows generated by the proposed project. Or reimbursement for the projects fair share shall be paid for the roadway improvements made at the intersection of Quintana and South Bay Blvd.
2. ~~Sidewalks shall be installed that runs along both sides of the private road~~.
3. In order to maintain a safe condition while construction activity occurs the applicant shall work with the City Engineer to determine what specific improvements shall be completed before grading and construction activity begins.

Utilities & Service Systems

1. The Developer shall pay a pro-rata fair share to the City as an impact fee toward the construction of municipal sewer improvements as determined by the Engineering Division in accordance with the Water and Sewer System Master Plan.

CITY COUNCIL CONDITIONS

1. An HOA or equivalent management entity shall be required to be implemented prior to occupancy.
2. Architectural extensions may exceed 18'-6" in height, not including satellite dishes.
3. Second story floor area shall be limited to 75% of first floor area.
4. Individual lots shall meet fire codes for setbacks, building, and maintenance standards for wildland interface.
5. The access drive and cul-de-sac turn-a-round shall meet minimum City standards for safety and access. A 20' wide access drive with **four foot** pervious walkway shall be provided **on the cul-de-sac** per City standards.
6. Habitat mitigation shall be implemented per individual lot development and restoration activities performed prior to occupancy.
7. The use of chemical herbicides within the open pace easement shall be prohibited by the CC&R's. Herbicide use within the Building Envelope shall be restricted to environmentally friendly varieties.
8. Affordable Housing in-lieu fees shall be calculated using a building construction cost of $150 per square foot.

CONDITIONS OF APPROVAL AS REVISED PER PLANNING COMMISSION
For SOO-062/UPO-138/CPO-207
VESTING TENTATIVE TRACT MAP/ CONDITIONAL USE PRECISE PLAN/ COASTAL DEVELOPMENT PERMIT CONDITIONS:

1. This Vesting Tentative Tract Map, Conditional Use Precise Plan Permit, and Coastal Development Permit is granted for the use as described in the staff report and the on plans received by the Public Services Department, ("Exhibit C" of the staff reports). The Vesting Tentative Tract Map 2870 dated March 25, 2009 is granted approval. The approval is modified, however, by the following Conditions of Approval:

2. Inaugurate Within Two Years: If the approved use is not established within two (2) years of the effective date of this approval, this approval will automatically become null and void. However, upon written request by the applicant prior to the expiration date of this approval, up to two (2) one-year time extensions may be granted. Said extensions may be granted by the Public Services Director, upon finding that the project complies with all applicable provisions of the Morro Bay Municipal Code, General Plan and Local Coastal Program Land Use Plan (LCP) in effect at the time of the extension request.

3. Changes: Minor changes to the project description and/or conditions of approval shall be subject to review and approval by the Public Services Director. Any changes to this approved permit determined not to be minor by the Director shall require the filing of an amendment subject to Planning Commission review.

4. Compliance with the Law: All requirements of any law, ordinance or regulation of the State of California, City of Morro Bay, and any other governmental entity shall be complied with in the exercise of this approval. This project shall meet all applicable requirements under the Morro Bay Municipal Code, and shall be consistent with all programs and policies contained in the certified Coastal Land Use Plan and General Plan for the City of Morro Bay.

5. Hold Harmless: The applicant, as a condition of approval, hereby agrees to defend, indemnify, and hold harmless the City, its agents, officers, and employees, from any claim, action, or proceeding against the City as a result of the action or inaction by the City, or from any claim to attack, set aside, void, or annul this approval by the City of the applicant's project; or applicants failure to comply with conditions of approval. This condition and agreement shall be binding on all successors and assigns.

11. Compliance with Conditions: The applicant's establishment of the use and/or development of the subject property constitutes acknowledgement and acceptance of all Conditions of Approval. Compliance with and execution of all conditions listed hereon shall be required prior to obtaining final building inspection clearance. Deviation from this requirement shall be permitted only by written consent of the Public Services Director and/or as authorized by the Planning Commission. Failure to comply with these conditions shall render this entitlement, at the discretion of the Director, null and void. Continuation of the use without a valid entitlement will constitute a violation of the Morro Bay Municipal Code and is a misdemeanor.

12. Utility Services: All water and sewer impact fees shall be paid at the time the building permit is issued.

13. Property Line Verification. It is owner's responsibility to verify lot lines. Prior to foundation inspection the lot corners shall be staked and setbacks marked by a licensed professional.

14. Park In-lieu Fee. Prior to recordation of the Final Map requirements of the City of Morro Bay for dedication of land for park purposes and/or payment of fee-in-lieu thereof shall be met (MBMC Section 16.13.005).

PUBLIC WORKS CONDITIONS

1. The private street, off Teresa Drive, shall be constructed per City Standard A-7 and designed to carry a vehicle with a 60,000 lb wheel load. The cul-de-sac shall be constructed per City Standard A-5 with a modified radius of 42 ft and a 2% cross slope in the cul-de-sac bulb shall be constructed with either standard concrete curb and gutter or a rolled concrete curb and gutter with the same hydraulic capacity as a standard curb and gutter. The street adjacent the fire hydrants shall be 26 feet wide for a distance of 20 feet per California Fire Code.

2. All public and private improvements including; Teresa Dr and sidewalk extension, Cul-de-sac, detention facility, porous walkway, utilities stubbed to each lot and street trees shall be built or bonded for prior to Final Map recordation.

3. ~~The Developer shall pay their pro-rate fair share to the City as an impact fee toward the construction of municipal sewer improvements, or if the lift station #3 is found to be at capacity the developer shall build the lift station and enter into an agreement for reimbursement.~~ *Prior to recordation of the final map, the subdivider shall either (1) pay their pro-rata share to the City as an impact fee toward the construction of municipal sewer collection system improvements that this project is contributary to and are identified in the adopted Sewer Collection System Master Plan Update, dated May 2006; or (2) if lift station #3 is found to be at capacity, the subdivider shall construct the Priority 1 and 2 lift station improvements identified in the System Master Plan and enter into an agreement for reimbursement pursuant to Title 16-14.008 of the Morro Bay Municipal Code, and pay their fair share for the remaining downstream sewer collection improvements identified in Figure 5-4 of said Master Plan.*

4. Improvements to Teresa Drive shall be per the cross section on the approved Vesting Tentative Map with a T.I. of 6 and the R value determined at the time of construction with a minimum asphalt section of 3 inches.

5. The existing Teresa Drive shall be evaluated and upgraded to provide a structural section for a T.I of 6. Prior to installing the stripping for the entrance, to Teresa Drive from South Bay Blvd, either overlaid or slurry sealed to the satisfaction of the City Engineer.

6. All subdivision improvements shall be per the Vesting Tentative Map, dated March 25, 2009 except as modified by City Council approval for SOO-62/UPO-138/CPO-207 on April 13, 2009 and this action.

7. The Site development; grading, drainage, erosion and sediment controls, shall be in accordance with the Stormwater Pollution Prevention Plan for the entire site.

PLANNING CONDITIONS

1. Final *tract* landscape plans shall be submitted for approval by the Planning Department and shall meet compliance with the approved Concept Plan. *Tract* landscape improvements *along Teresa Drive frontage of Lots 1 and 10, including the detention basin, graded slopes and project screening , shall be installed with tract improvements.* ~~or prior to issuance of first building permit~~. *Tract landscape improvements along the cul-de-sac shall be installed prior to final occupancy* **on each lot**. Maintenance and replacement of dead plant material shall be included in the CC&Rs.

2. To implement the provisions of the CC&R's and Design Manual, a design review Committee that includes at least two technically trained persons from an architectural firm (one shall be a licensed architect) and one property owner, shall be formed by the HOA or equivalent entity in order to perform a third party review of architectural design and control prior to submittal of a Precise Plan to the City. A letter of approval from the Committee acknowledging consistency with the Sea Shell Estates Design Manual shall be provided to the City with the application for Precise Plan.

3. Building Footprint definition: The 3,600 square foot building footprint is the cumulative square footage of all *covered* structures within the building envelope *(ie. Home, garage, accessory building and uncovered decks over 30 inches in height). Uncovered decks under 30 inches in height, patios, walls, and walkways are not included as structures as it pertains to lot coverage.*

4. After the 6,600 square foot building envelope has been established on each lot, the remaining area within the development limit line shall be transferred into the open space conservation easement by a method approved by the City.

5. Consistent with the approved Concept Plan, no further division of the lots shall be allowed.

6. A Lot Line Adjustment shall be recorded adjusting the eastern boundary to comply with the boundary shown on the Vesting Tentative Tract map prior to recordation of the Final Map.

7. *The Design Manual shall be used as a basis (guideline) for City of Morro Bay approvals for all subsequent permits. Any sections of the manual which conflict with California state law, City of Morro Bay Municipal Code or project approvals shall be void.*

FIRE CONDITIONS

1. **Access road**. Approved Fire apparatus access roads shall be provided for every building constructed when any portion of an exterior wall of the first story is located more than

150' from Fire Department vehicle access (CFC 503.1.1). Plan illustrates a 450' access road.

2. **Dead end access road**. Roads in excess of 150' in length shall be provided with an approved turnaround for fire apparatus (CFC 503.2.5). Provide a 42' radius cul-de-sac turnaround with no parking.

3. **Access road** shall have all-weather driving surface rated by a soil engineer to be capable of supporting fire apparatus weighing 60,000 (CFC 503.2.3).

4. **Access road**. The access road shall have a minimum net road width of 20 feet and all curbs painted red or provide appropriate red-striping at least 6" wide with "Fire Lane-No Parking" stenciled every 20' to maintain 20' minimum unobstructed width (CFC 503.4).

5. **Access road** grade shall not exceed 12.00% unless authorized by the Chief. (CFC 503.2.7)

6. **Water Supply and Fire Life Safety.**
Provide three (3) fire hydrants as illustrated on conceptual plan. The location, number and type of fire hydrants connected to a water supply capable of delivering the required fire-flow shall be provided (CFC 508.5).

7. **Fire Sprinklers**. All new construction of the 10-lot subdivision shall be fully sprinklered, in accordance with NFPA 13-D. (MBMC 14.60.200) Please submit plans to Morro Bay Public Services for review.

8. **Wildland Urban Interface**. Lands in the state are classified by CDF Director in accordance with the severity of wildland hazard expected to prevail in those areas and responsibility for fire protection, so that measures may be identified which will reduce the potential for losses of life, property, and resources from wildfire. The north and eastern boundaries of the project site are located next to a designated Moderate Hazard Wildland-Urban Interface Area. Prior to issuance of a building permit, the applicant shall demonstrate that proposed construction will comply with Fire, Building, and California Public Resources Code (Section 4291), relative to vegetation clearance and defensible space.

PLANNING COMMISSION CONDITIONS

1. The CC&Rs shall include:
   A. Requirements for formation of a design review committee and for the review process.

   B. The document shall include specifics on the Conservation Open Space maintenance tasks, schedule, and responsible parties.

C. The document shall incorporate the environmental mitigations approved by the City Council on April 13, 2009.

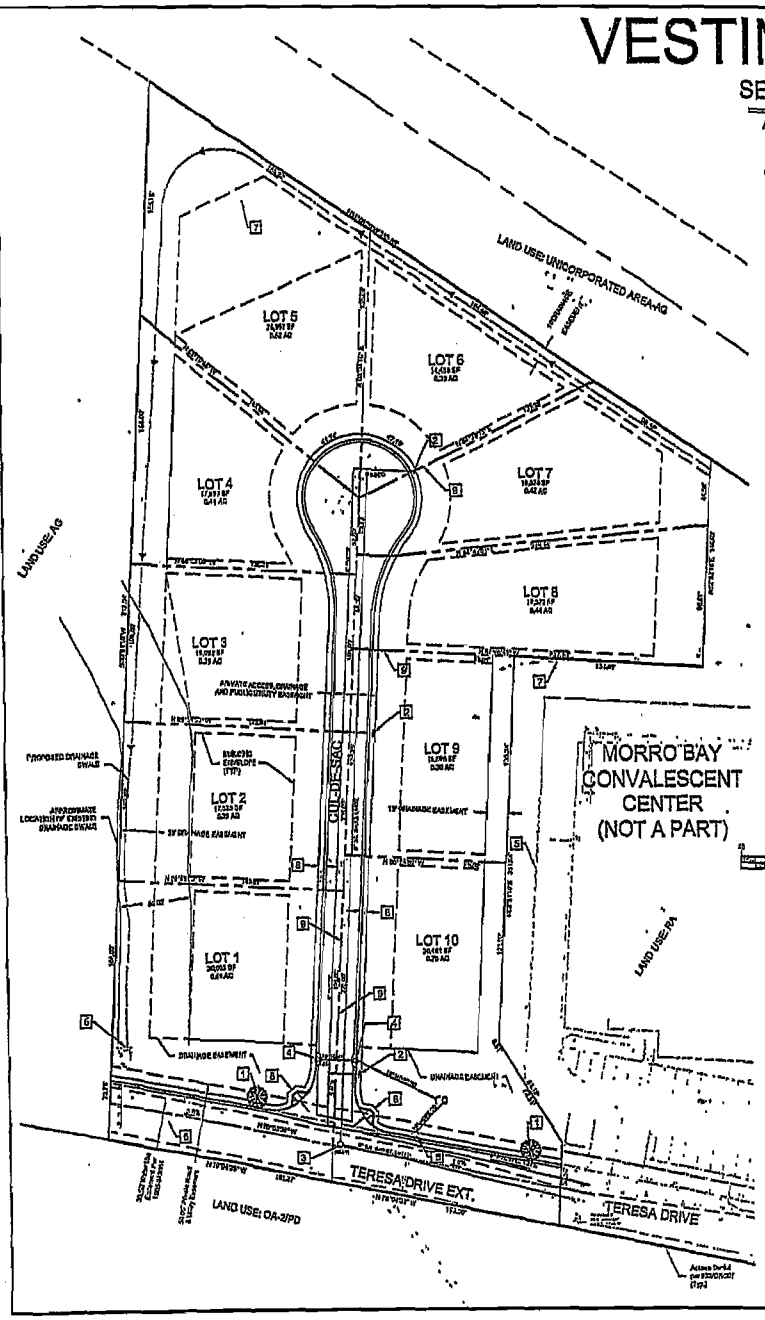
D. The document shall contain a process for transferring the building envelope area in excess of 6,600 square feet into the conservation open space easement.

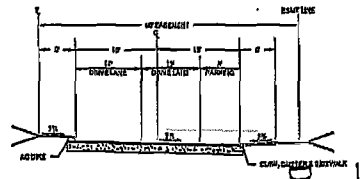
2. Designate a definitive muted color palette within the CC&R's and Design Manual utilizing the Munsell book of colors to designate a range of hues, values, and chromas for project structures.

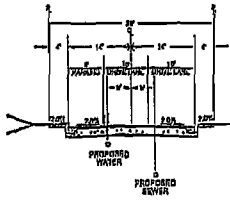
VESTING TENTATIVE MAP

SEASHELL ESTATES TRACT NO. 2870

A PORTION OF LOT 11 OF THE SUBDIVISION OF RANCHO SAN BERNARDO, IN THE CITY OF MORRO BAY, COUNTY OF SAN LUIS OBISPO, STATE OF CALIFORNIA, SAID SUBDIVISION OF RANCHO BEING SHOWN ON THE MAP MADE BY R.R. HARRIS, DECEMBER 1894, AND RECORDED IN BOOK 1, PAGE 6 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, DESCRIBED AS PARCEL A OF DOCUMENT NO. 2001-003433 OF OFFICIAL RECORDS IN SAID OFFICE OF THE COUNTY RECORDER.

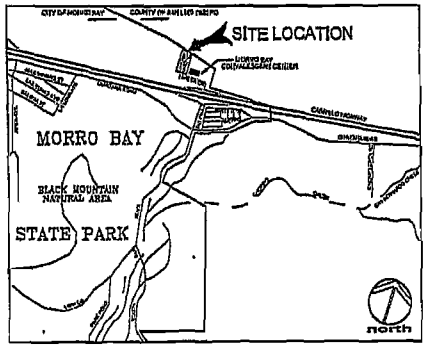






KEY NOTES

1. PROPOSED STREET TREE
2. PROPOSED FIRE HYDRANT
3. NEW DROP MANHOLE
4. NEW STORM DRAIN INLET
5. STRUCTURE TO REMAIN
6. CHORRO VALLEY PIPELINE, TO REMAIN
7. FENCE TO BE REMOVED/RELOCATED
8. 4' MINIMUM SIDEWALK
9. PROPERTY LINE



VICINITY MAP
-NTS-

APPLICANT/OWNER:

ROBERT J. ZINNEGRABE, TRUSTEE
13820 HOOVER STREET
WESTMINSTER, CA 92683

PROPERTY DATA:

APN: 066-411-005
AREA: 4.75 ACRES

EXISTING ZONING: RA/PD
PROPOSED ZONING: RA/PD

PROPOSED LOT SIZE: 12,000-30,500 SF

OPEN SPACE CALCULATION (AS PROJECT IS PRESENTED):

TOTAL LOT:	4.75 AC
BUILDING ENVELOPES:	1.97 AC
IMPERVIOUS AREA OUTSIDE OF BLDG ENVELOPES:	0.87 AC
OPEN SPACE (REMAINDER OF PARCEL):	1.91 AC (40.2%)

OPEN SPACE CALCULATION (WITH REDUCTION OF ROAD WIDTH TO 20' AND ELIMINATION OF SIDEWALKS ON PROJECT PRIVATE DRIVE):

TOTAL LOT:	4.75 AC
BUILDING ENVELOPES:	1.97 AC
IMPERVIOUS AREA OUTSIDE OF BLDG ENVELOPES:	0.70 AC
OPEN SPACE (REMAINDER OF PARCEL):	2.08 AC (43.8%)

ENGINEER:

ABOVE GRADE ENGINEERING, INC.
776 OSOS STREET, SUITE A
SAN LUIS OBISPO, CA 93401
PHONE: (805) 540-5115
FAX: (805) 540-5116

CONTACT: SCOTT J. STOKES, PE 69255

AGENT:

CATHY NOVAK CONSULTING
PO BOX 1295
MORRO BAY, CA 93443
PHONE/FAX: (805) 772-9499

CONTACT: CATHY NOVAK

STEVEN D. PULTS, A.I.A., & ASSOCIATES
1450 BROAD STREET, SUITE 100
SAN LUIS OBISPO, CA 93401
PHONE: (805) 541-5534

CONTACT: TIM WOODLE, A.I.A.

BENCHMARK:

THE HORIZONTAL CONTROL FOR THIS SURVEY IS BASED UPON THE NORTH AMERICAN DATUM OF 1983 (NAD 83), CALIFORNIA ZONE 5 PER THE CALTRANS DISTRICT 5 PUBLIC CONTROL NETWORK INFORMATION. THE BASIS OF BEARINGS FOR THIS PROJECT IS BETWEEN POINT 68, A FOUND 3.25 INCH ALUMINUM DISK, STAMPED 3LO-01 PM 53.6 CP-7 1995 AND HAVING THE CALTRANS DISTRICT 5 DESIGNATION OF "3LO1 PM 53.6" AND HAVING NAD83(92) CONVERTED IMPERIAL COORDINATES OF N12,421,100.07 E15,639,668.28 FROM WHICH POINT 15, A FOUND STD. NGS BRASS DISK, STAMPED A 1316 1977 AND HAVING THE CALTRANS DISTRICT 5 DESIGNATION OF "3LO1 A 1316 1977" AND HAVING THE NAD83(92) CONVERTED IMPERIAL COORDINATES OF N12,421,140.15 E15,738,107.07, BEARS SOUTH 87°19'22" WEST 1,731.09' (1,733.34' PER CALTRANS DISTRICT 5 PUBLIC CONTROL NETWORK INFORMATION) (NOT SHOWN).

VERTICAL CONTROL IS BASED ON POINT 15, A FOUND 3 INCH BRASS CAP STAMPED A 1316 1977, SET IN LARGE ROCK OUTCROP, HAVING A PUBLISHED NGS NAVD 88 ELEVATION OF 178.81 FEET.

FIELD SURVEY PERFORMED ON APRIL 03 AND 15, 2004.

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C-1 VESTING TENTATIVE MAP & PRELIMINARY UTILITY PLAN
C-2 AERIAL MAP & BIOLOGICAL MAP
C-3 PRELIMINARY GRADING PLAN
C-4 TERESA DRIVE EXTENSION PLAN & PROFILE
C-5 CUL-DE-SAC PLAN AND PROFILE
C-6 STRIPING AND SIGNAGE PLAN
C-7 DETAILS

LEGEND:

(E)	EXISTING		EXISTING STORM DRAIN
EG	EXISTING GROUND		EXISTING WATER LINE
EP	EDGE OF PAVEMENT		EXISTING SEWER LINE
FS	FINISH SURFACE		EXISTING GAS LINE
FG	FINISH GRADE		EXISTING ELECTRICAL CONDUIT
GB	GRADE BREAK		EXISTING FIBER OPTICAL CONDUIT
TG	TOP OF CURB		CATCH BASIN (CB)
TC	TOP OF CURB		AREA DRAIN (AD)
L	LENGTH	HDPE	HIGH DENSITY POLYETHYLENE
S	SLOPE	SDMH	STORM DRAIN MANHOLE
INV	INVERT		STORM DRAIN
Q	RATE & DIRECTION OF FLOW		WATER LINE
345.00	ELEVATION		SANITARY SEWER
	CONCRETE SWALE		ELECTRICAL CONDUIT
	EXISTING FENCE		COMMUNICATION CONDUIT
	EXISTING INDEX CONTOUR		JOINT TRENCH
	EXISTING INTERMEDIATE CONTOUR		PROPERTY LINE
	PROPOSED INDEX CONTOUR		PROPOSED SAW CUT
	PROPOSED INTERMEDIATE CONTOUR		

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fax: (805) 540-5116
www.abovegrade.com

ENGINEER OF RECORD:

DATE:

SEASHELL ESTATES - TRACT 2870
MORRO BAY, CA

VESTING TENTATIVE MAP
PRELIMINARY UTILITY PLAN

NO.	REVISION	DATE

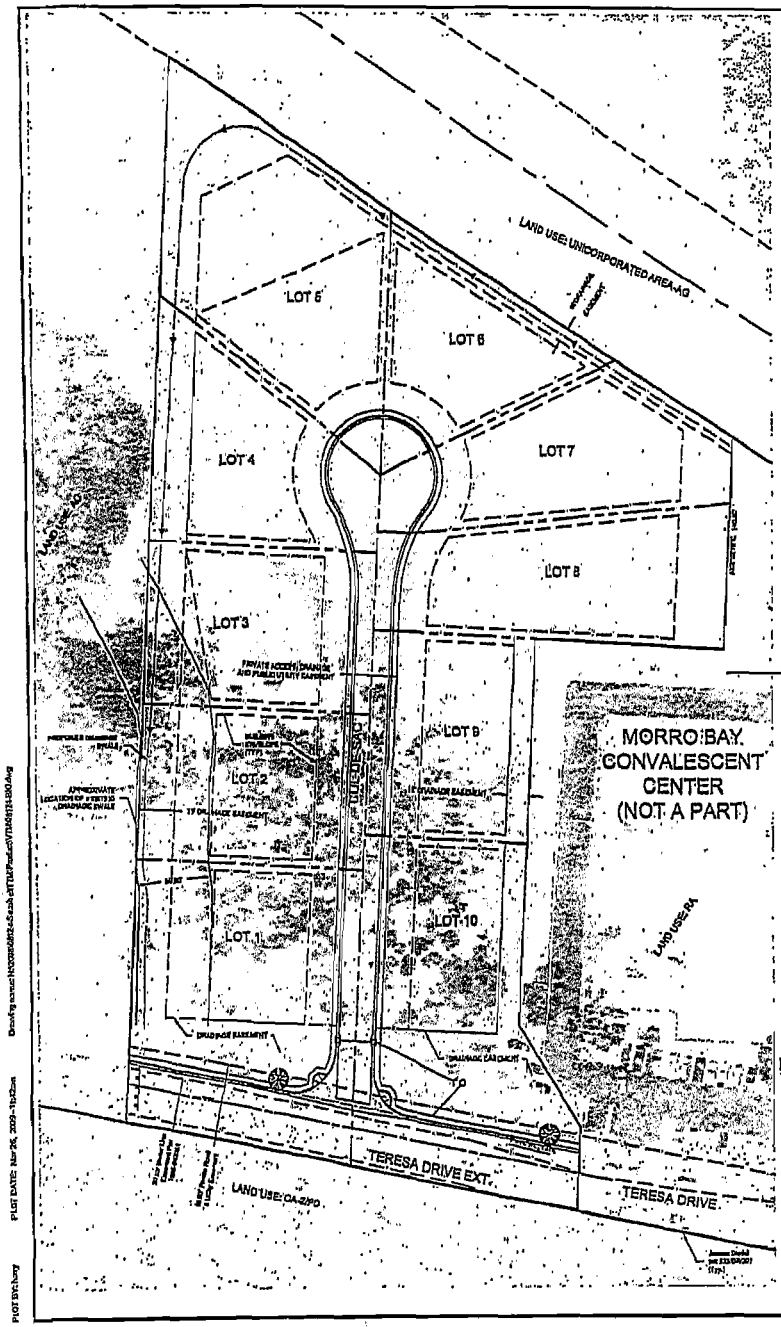
DESIGNED: HWH
DRAWN: HWH
JOB NUMBER: 06124

SHEET:
C-1

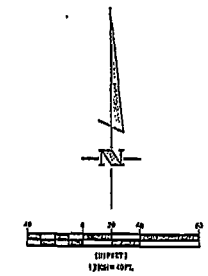
DATE: MARCH 25, 2009

CITY OF MORRO BAY
PLANNING DEPARTMENT
APPROVED
6-23-09
Signature
with conditions

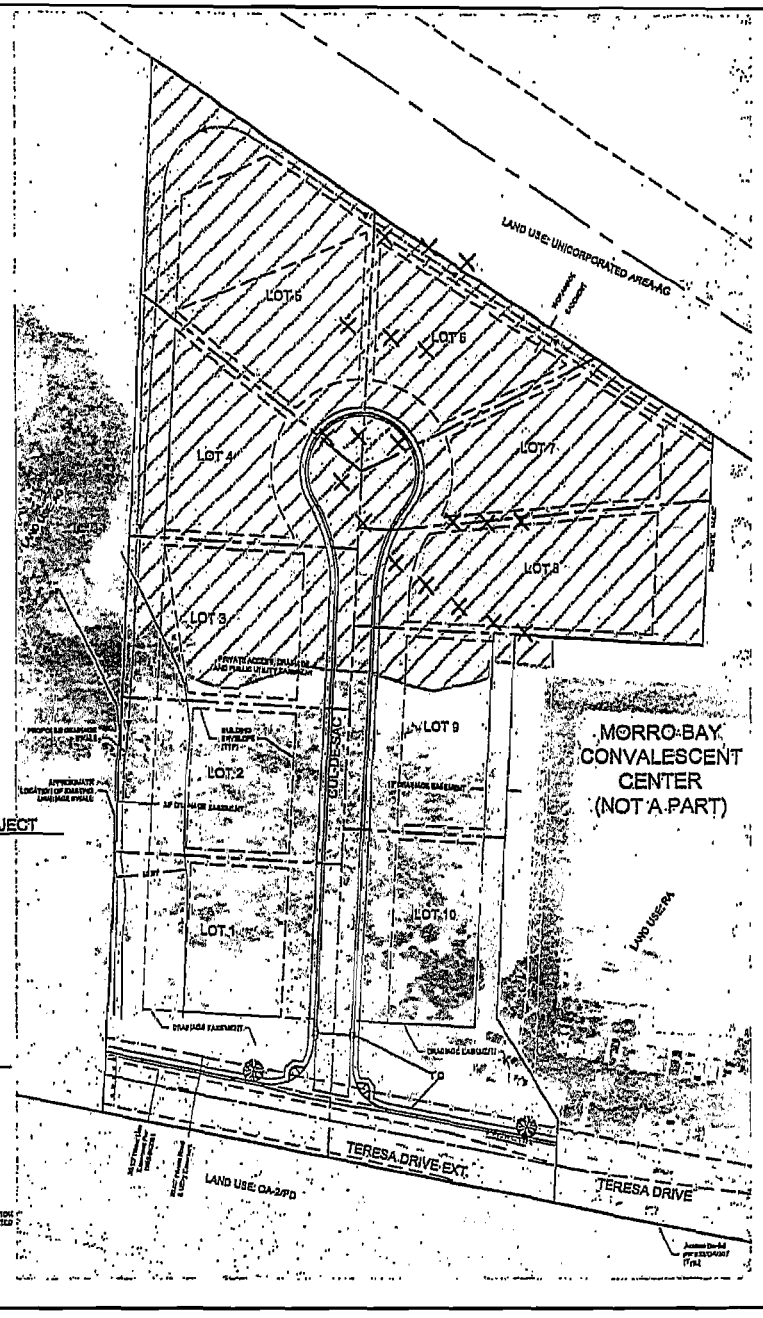
PLOT DATE: Mar 26, 2009 - 11:48am
Drawing name: NAS0706131-Sheet1 (TTL) Product (VTM3012-VTM.dwg
PLOT STYLE: Jerry



AERIAL VIEW OF PROJECT



BIOLOGICAL MAP OF PROJECT



BIOLOGICAL LEGEND

- CENTRAL (LUCIAN) COASTAL SCRUB
- CENTRAL COAST NONNATIVE SCRUB
- HIGH NATIVE ANNUAL GRASSLAND
- SENSITIVE SUBCHARACTER
- ROCK OUTCROP

BIOLOGICAL MAP INFORMATION FROM FIGURE 6, VEGETATION HABITAT MAP FROM "BIOLOGICAL SCREENING REPORT" PREPARED BY JENSEN, DATED APRIL 12, 2001.

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ENGINEER OF RECORD:

DATE:

SEASHELL ESTATES - TRACT 2870
MORRO BAY, CA

AERIAL VIEW & BIOLOGICAL MAP

NO.	REVISION	DATE

DESIGNED: HWH
DRAWN: HWH
JOB NUMBER: 08124

SHEET: C-2

DATE: MARCH 28, 2009

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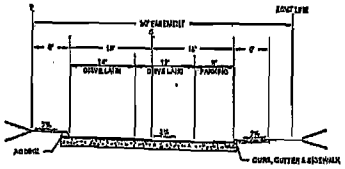
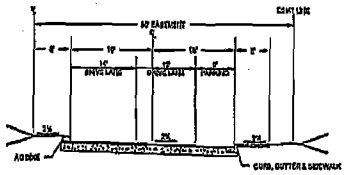
PLOT BY: hwh



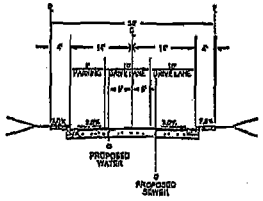
TERESA DRIVE SECTION

-NTS-



TERESA DRIVE EXTENSION SECTION

-NTS-

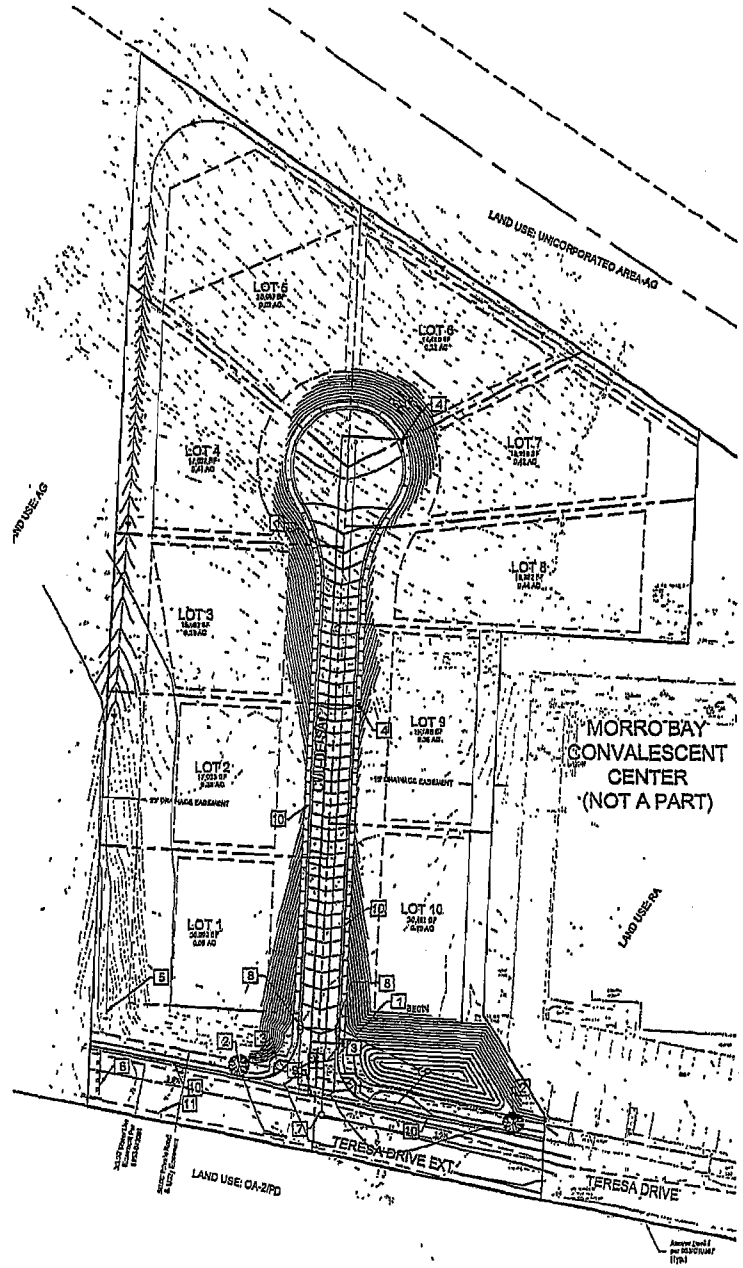


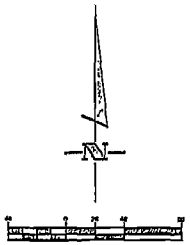
CUL-DE-SAC STREET SECTION

-NTS-

KEY NOTES

1. NO PARKING, PAINT CURB RED
2. STREET TREE
3. NEW CURB RAMP PER CALTRANS 2005 STD, DETAIL E, SHT 5
4. NEW FIRE HYDRANT PER SLO CO. STD. DETAIL D, SHT 5
5. EXISTING HEADWALL/INLET
6. TEMPORARY WOOD BEAM BARRICADE PER SLO CO. STD. DETAIL B, SHT 8
7. NEW DROP MANHOLE PER SLO CO. STD. DETAIL C, SHT 5
8. NEW STORM DRAIN INLET PER SLO CO. STD. DETAIL F, SHT 5
9. NEW CONCRETE CROSS GUTTER PER SLO CO. STD. DETAIL A, SHT 8
10. NEW CURB AND GUTTER PER SLO CO. STD. DETAIL G, SHT 5
11. NEW A.C. DIKE TYPE B PER SLO CO. STD. DETAIL G, SHT 5





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phone: (805) 540-5115
fax: (805) 540-5116

ENGINEER OF RECORD

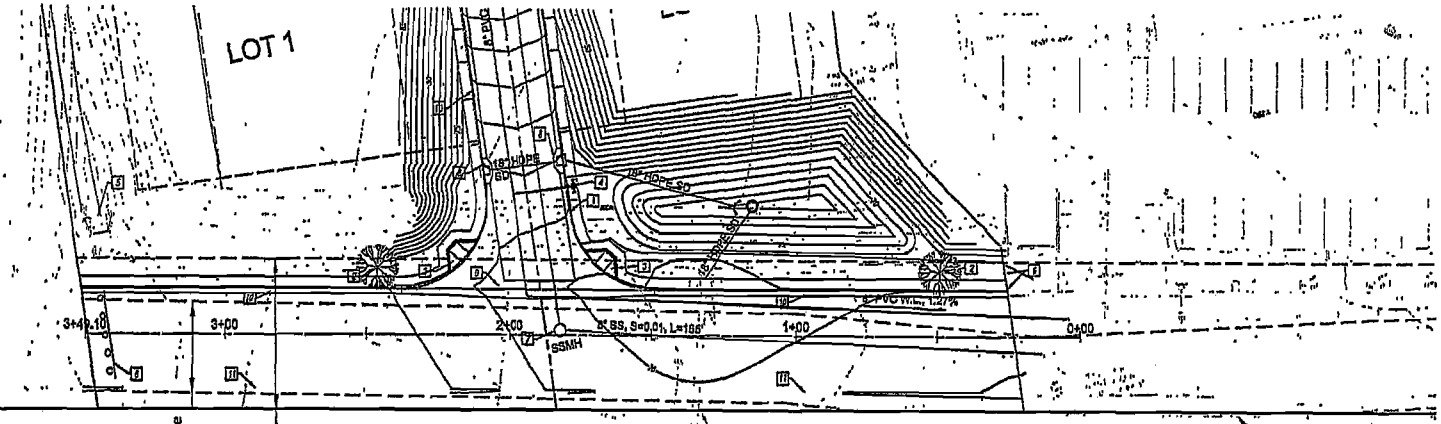
DATE:

SEASHELL ESTATES - TRACT 2870
MORRO BAY, CA

PRELIMINARY GRADING PLAN

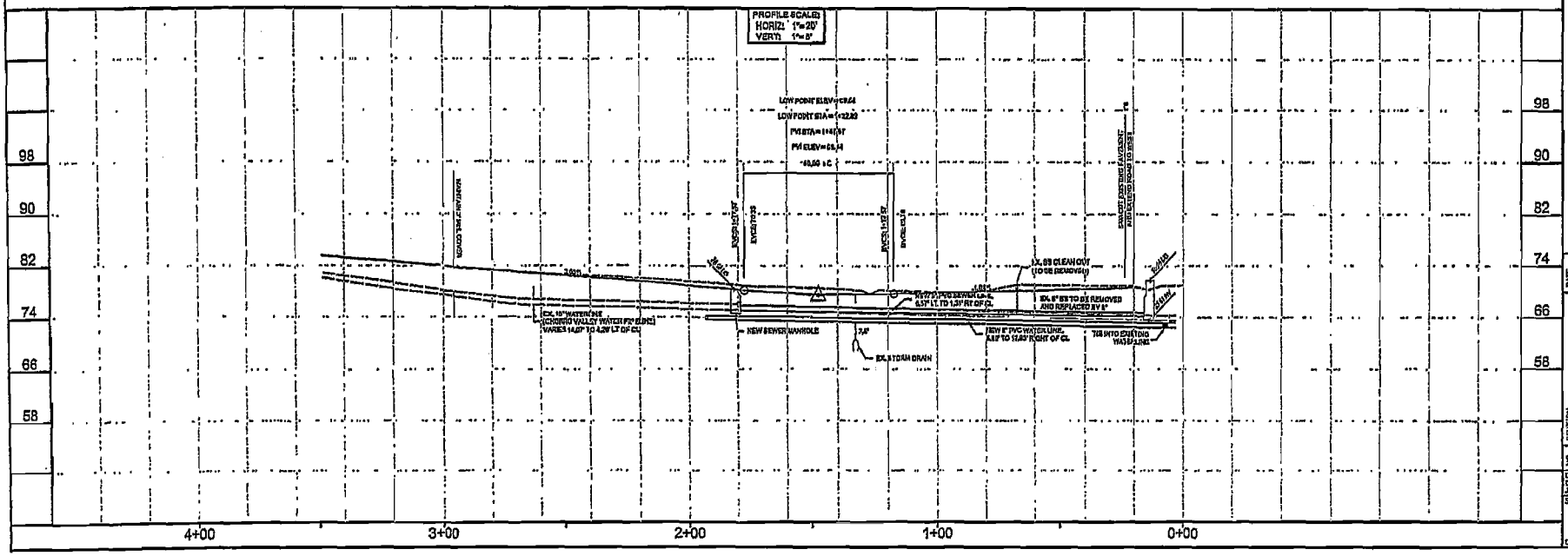
NO.	REVISION	DATE

ORIGINATOR: HWH
DRAWN: HWH
JOB NUMBER: 08124
SHEET: C-3
DATE: MARCH 25, 2009



KEY NOTES

1. NO PARKING, PAINT CURB RED
2. STREET TREE
3. NEW CURB RAMP PER CALTRANS 2006 STD. DETAIL E, SHT 6
4. NEW FIRE HYDRANT PER SLO CO. STD. DETAIL D, SHT 5
5. EXISTING HEADWALL/INLET
6. TEMPORARY WOOD BEAM BARRICADE PER SLO CO. STD. DETAIL B, SHT 5
7. NEW DROP MANHOLE PER SLO CO. STD. DETAIL C, SHT 5
8. NEW STORM DRAIN INLET PER SLO CO. STD. DETAIL F, SHT 5
9. NEW CONCRETE CROSS GUTTER PER SLO CO. STD. DETAIL A, SHT 5
10. NEW CURB AND GUTTER PER SLO CO. STD. DETAIL G, SHT 5
11. NEW A.C. DIKE TYPE B PER SLO CO. STD. DETAIL G, SHT 5



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fax: (805) 540-5116

ENGINEER OF RECORD:

DATE:

SEASHELL ESTATES - TRACT 2870
MORRO BAY, CA

PLAN AND PROFILE
TERESA DRIVE EXTENSION

NO.	REVISION	DATE

DESIGNED: HWH
DRAWN: HWH
JOB NUMBER: 06124
SHEET: C-4
DATE: MARCH 28, 2008

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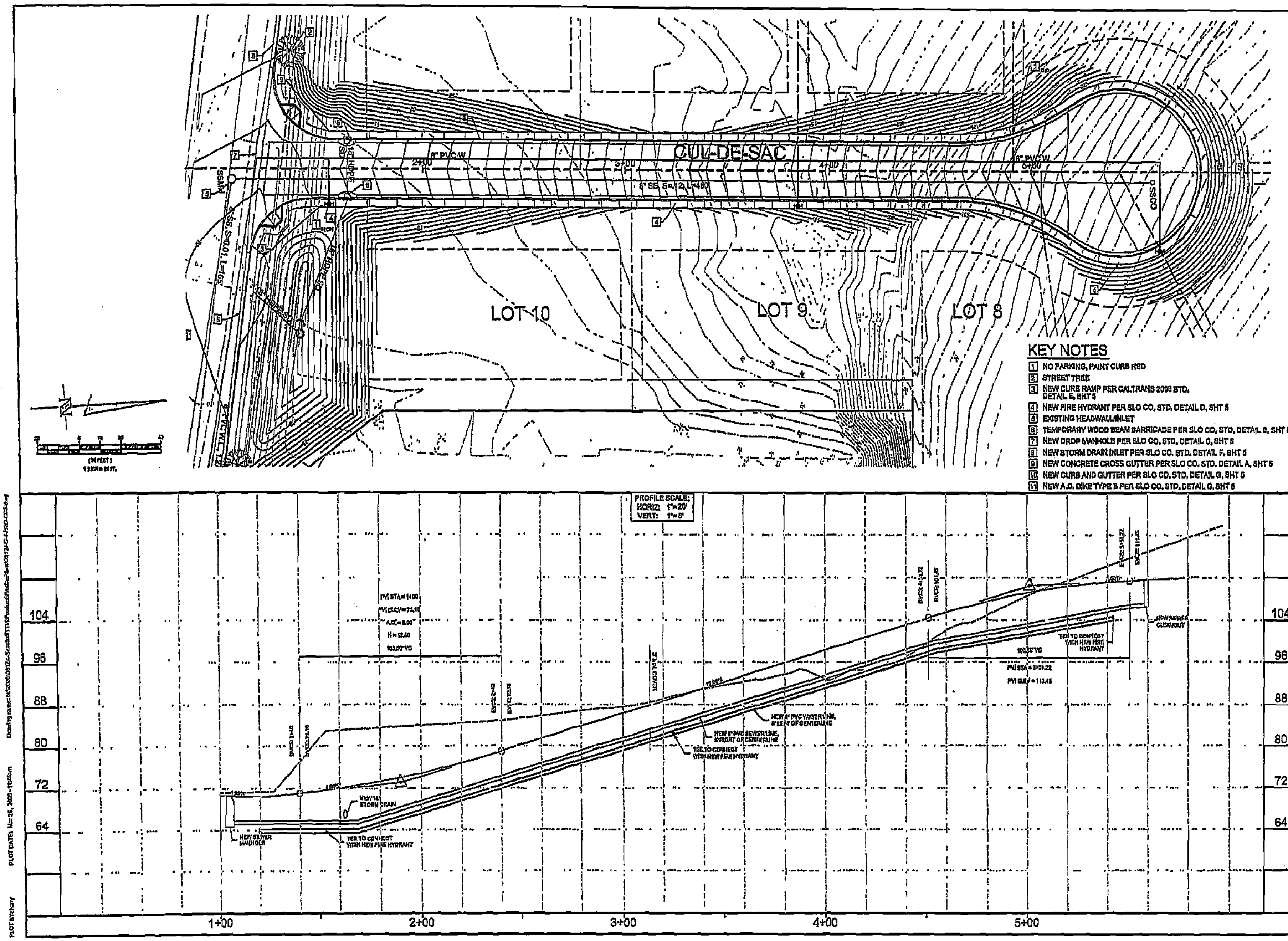

ABOVE GRADE ENGINEERING

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San Luis Obispo, CA 93401
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fax: (805) 540-5116

ENGINEER OF RECORD:

DATE:

SEASHELL ESTATES - TRACT 2870
MORRO BAY, CA

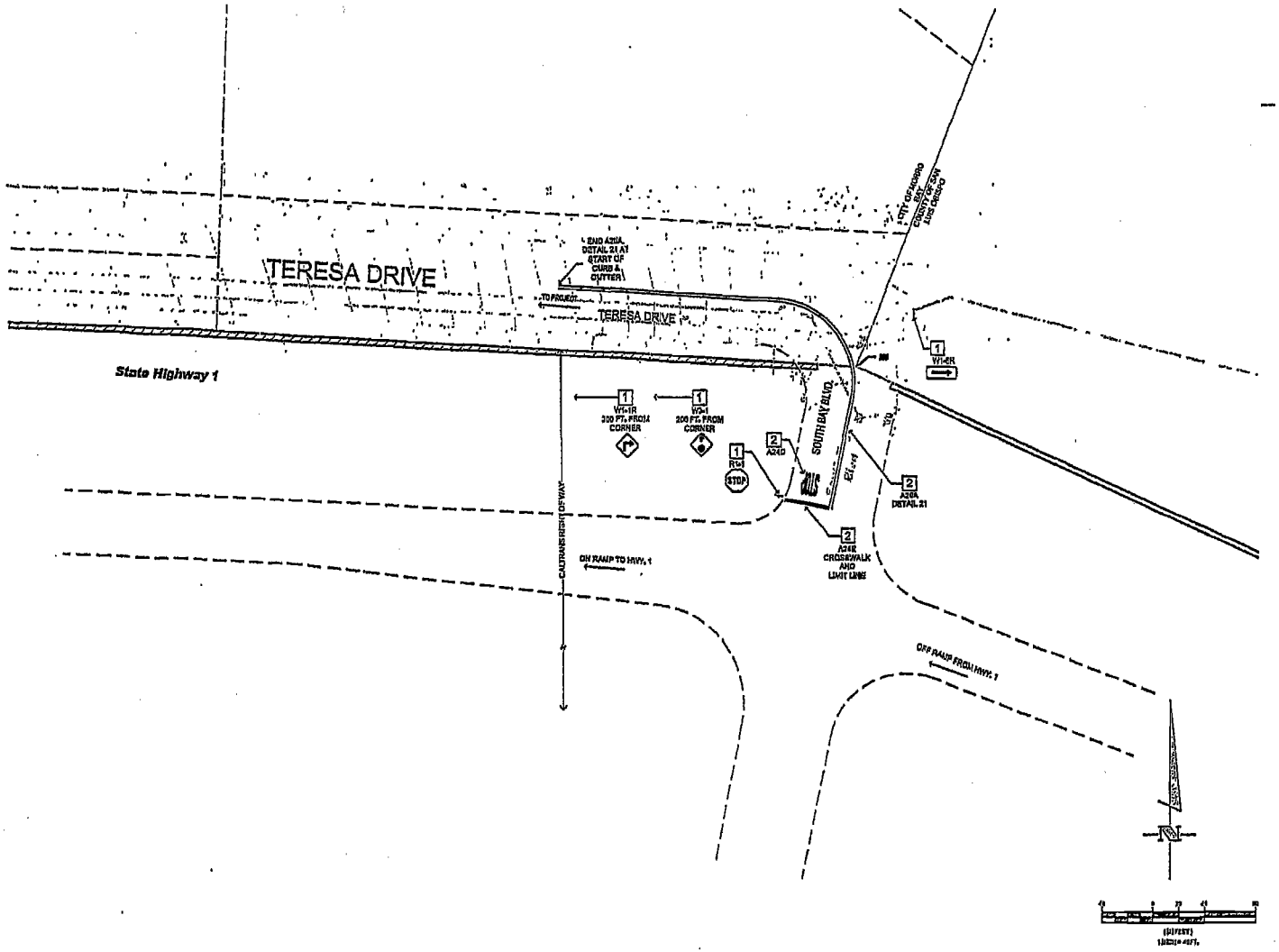
PLAN AND PROFILE
CUL-DE-SAC

NO.	REVISION	DATE

DESIGNED: HWH
DRAWN: HWH
JOB NUMBER: 08124

SHEET:
C-5

DATE: MARCH 26, 2009



KEY NOTES:

1. INSTALL CALTRANS/MUTCD SIGN NO. INDICATED PER STANDARD.
2. CALTRANS PAVEMENT MARKINGS PER STD PLAN NO. & DETAIL INDICATED.

REFER TO CALTRANS AS-BUILT DRAWINGS FOR INFORMATION WITHIN CALTRANS RIGHT-OF-WAY. EXISTING PAVEMENT LINES SHOWN AS DASHED LINES ON THIS PLAN ARE FOR SCHEMATIC USE ONLY.

ABOVE GRADE ENGINEERING
773 Cross Street, Suite A
San Luis Obispo, CA 93401
phone: (805) 540-5115
fax: (805) 540-5116

ENGINEER OF RECORD:

DATE:

SEASHELL ESTATES - TRACT 2870
MORRO BAY, CA

STRIPING AND SIGNAGE PLAN

NO.	REVISION	DATE

DESIGNED: HWH
DRAWN: HWH
JOB NUMBER: 06124

SHEET:
C-6

DATE: MARCH 25, 2009

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PLOT DATE: Mar 26, 2009-11:15am
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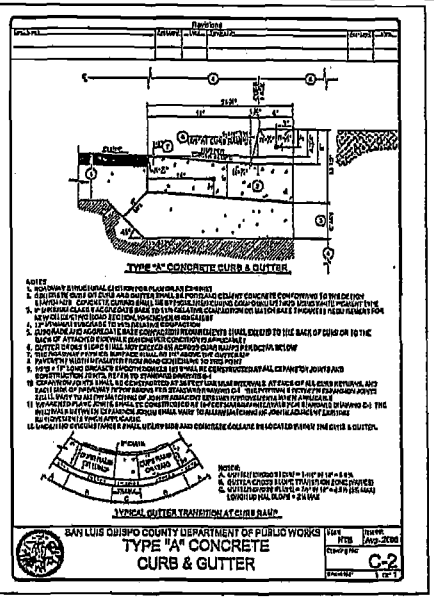
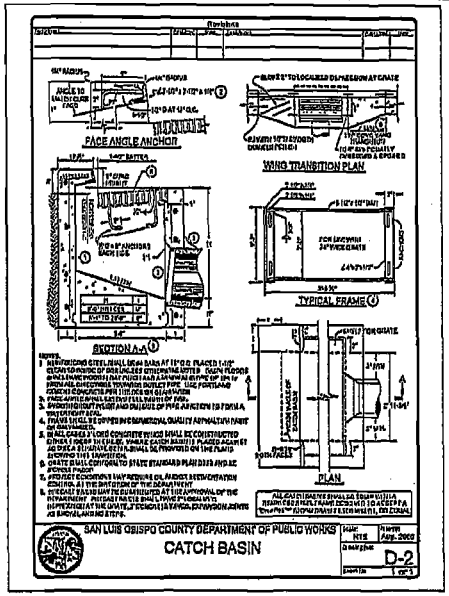
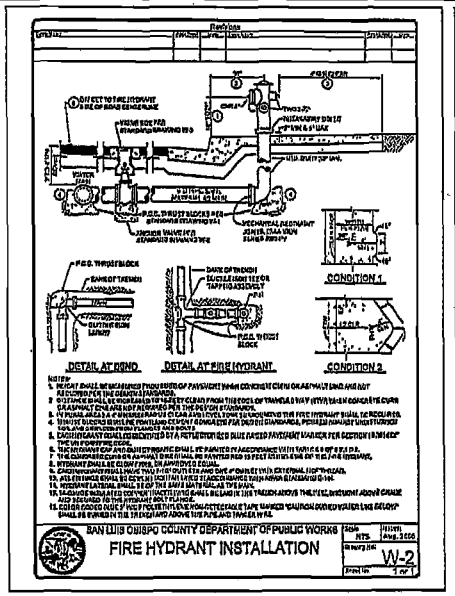


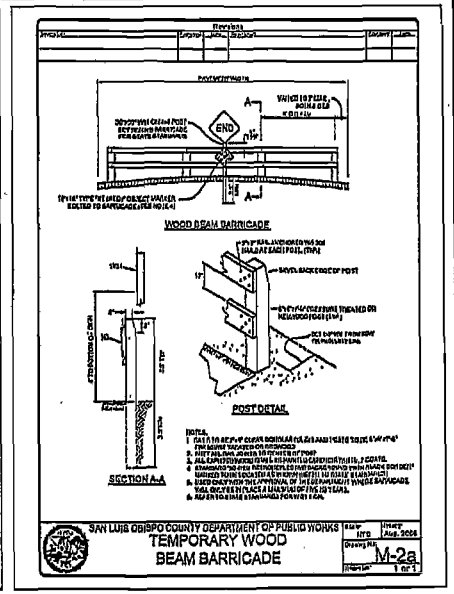
G CONCRETE CURB AND GUTTER



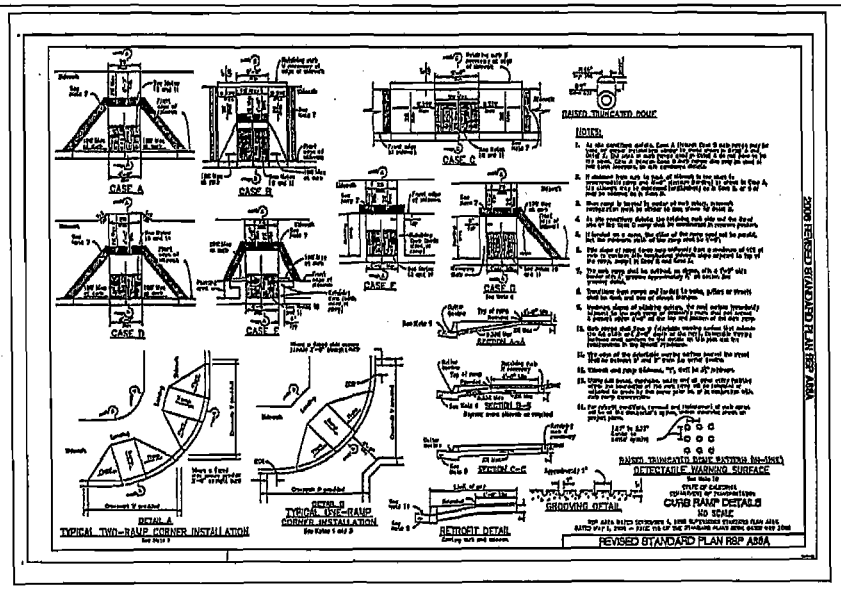
F STORM DRAIN INLET DETAIL



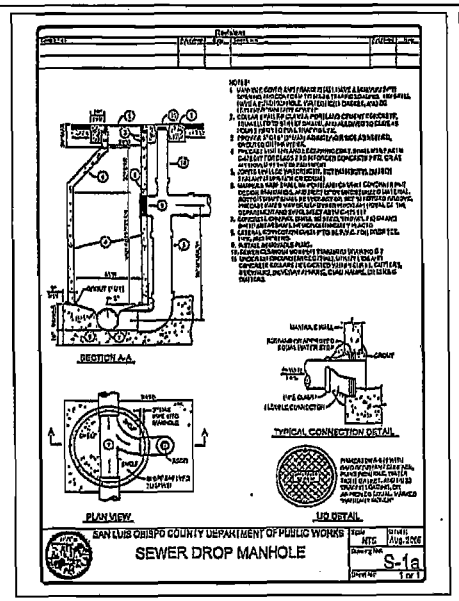
D FIRE HYDRANT INSTALLATION DETAIL



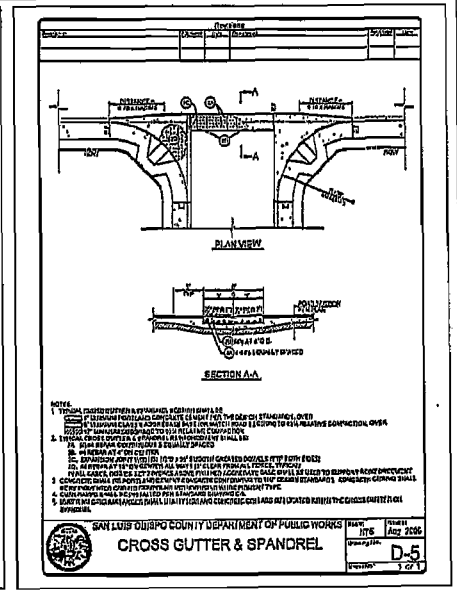
B TEMP WOOD BEAM BARRICADE DETAIL



E ACCESSIBLE RAMP DETAILS



C SEWER DROP MANHOLE



A CONCRETE CROSS GUTTER DETAIL

ABOVE GRADE ENGINEERING
770 Oak Street, Suite A
San Luis Obispo, CA 93401
phone: (805) 540-5155
fax: (805) 540-5156

ENGINEER OF RECORD

DATE:

SEASHELL ESTATES - TRACT 2870
MORRO BAY, CA

DETAIL SHEET

NO.	REVISION	DATE

DESIGNED: HWH
DRAWN: HWH
JOB NUMBER: 08124

SHEET: C-7

DATE: MARCH 25, 2009

PLOT DATE: Mar 26, 2009 - 11:27am
PLOT By: hany

Exhibit "C"
Design Manual

The Sea Shell Estates Design Manual

City of Morro Bay

Mayor – *Janice Peters*

Council Members – *Carla Borchard*

Noah Smukler

Rick Grantham

Betty Winholtz

Mission Statement –

The City of Morro Bay is dedicated to the preservation and enhancement of our quality of life, and strives to provide level of municipal service and safety consistent with and responsive to the needs of the public

Ongoing Service Objectives –

To provide responsible and effective governance of the community.
To achieve balance between the needs of the individual citizen and the community-at-large.

The material contained in *The Sea Shell Design Manual* was developed by Steven D. Pults, A.I.A.,& Associates, LLP and represents their best effort to illustrate clearly the subject of this report.

THE SEA SHELL ESTATES DESIGN MANUAL

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1.0 – INTRODUCTION

1.1 – Preface

The Sea Shell Estates is planned to explicitly harmonize with its natural setting. The goals for development at The Sea Shell Estates have been to understand the inherent, unique qualities and limitations of each site, to respond to the forces of the sun, wind and rain to seek an appropriate fit with the topography and existing vegetation. The Sea Shell Estates, like nature, is not static. The Sea Shell Estates idea is not just about individual homes; it is about creating an open space neighborhood development by blending buildings into the environment setting.

To help owners and their designers understand the philosophy of The Sea Shell Estates design and standards, Steven D. Pults, A.I.A., & Associates prepared a Design Manual. Steven D. Pults, A.I.A., & Associates will work to update the manual and combine it with Design Rules adopted in the CC & R's.

The Sea Shell Estates Design Manual contains a creative blend of design philosophy, general concepts and specific rules that takes into account and determines whether any specific improvement is compatible with The Sea Shell Estates. The document articulates guidelines for site development and architecture at The Sea Shell Estates, recognizing that each site is unique and that excellence in design ultimately means consistency with the shared image that is The Sea Shell Estates.

1.2 – The Sea Shell Estates Idea: A Shared Image

"LIVING GENTLY WITH THE LAND" is a phrase that has been used to describe the way of life at The Sea Shell Estates. It also expresses an approach to architectural design that is about respecting the existing character of the place and the unique context of each building site. It is about building in a manner that is appropriate to this special place.

2.0 – DYNAMICS

2.1 – Topography

The topography is providing the opportunity for multilevel homes that respond to the grade changes. It also requires more attention to drainage and grading.

2.2 – Landscape Dynamics

The landscape should be considerate as a process rather than as a composite of stated conditions. It should reflect and be an extension between the homes and the open space that flows and links the two indefinitely.

2.3 – Location, Orientation and Design

A Successful home at The Sea Shell Estates transcends the emphasis on the individual building to consider design issues in terms of the neighborhood and the larger community. Among these issues are the size and form of the building, its location on the site, the building's relation to the existing landscape features, both in the immediate and distant environment, the form, scale, materials, and color of building elements, the building's relationship to adjacent and nearby buildings, and the selection and massing of landscape elements. While all of these are normal components of individual building design, they become even more important when considered in relationship to The Sea Shell Estates as a whole.

2.4 – Neighborhood Planning

As groups of homes evolve, neighbors are encouraged to work together to explore the possibilities for enhancing views, achieving harmony through the location of the buildings on the site, developing continuity in the forms, size and scale of individual buildings and landscape planting.

2.5 – Green Building Concepts

The "Building Green" concept involves new ways of thinking about common building practices. Measures include a range from basic to more sophisticated strategies such as installing renewable energy systems. It is important to start integrating green strategies into the building process at an early stage.

In keeping with the shared image, "LIVING GENTLY WITH THE LAND" the Sea Shell Estates strongly support stewardship of the environment by implementing sustainable building methods.

Architects, designers, building and home owners are encouraged to put into practice greener building concepts for the site and home designs. Several measures are included in this manual. For further concepts, sample project guidelines and checklists are provided in Appendix A. These guidelines are not intended to be an exhaustive list, but rather a list of currently tested options that are more likely to be used.

3.0 – DESIGN GUIDELINES

3.1 – Purpose of the Design Guidelines

The design guidelines provided here are intended to describe, and inform the project designers and applicants of the City's expectations and preferences for the quality and character of new development. Exploring the sensory perception of a site is the first step in understanding the character of the place. All development projects should be designed in a manner that responds to the unique characteristics of their individual sites, but also into the wider context of Morro Bay.

These guidelines have been prepared because the City of Morro Bay has become a city with physical character and identity that are distinct, attractive, and widely appreciated by residents and visitors. Morro Bay intends to maintain and enhance its character with distinctive, attractive and a natural physical nature to its neighborhoods and surrounding areas.

The City of Morro Bay shall use the guidelines as a basis for evaluating the suitability and appropriateness of individual project design, to help achieve attractive and environmentally sensitive development. These guidelines cannot provide information on every potential situation or detail that may arise on a project. They do identify general concepts considered in the review of projects and provide more specific information on aspects of project design such as site planning, building design, parking, landscaping and open space.

3.2 – Applicability of the Design Review Process

The design review process can be used by the Design Review Committee and the City to guide development in the interests of the public health, safety and general welfare. This design review was established by The Sea Shell Estates and is to be used in conjunction with the other approvals that might be required for a project (such as Design Review Committee approval, a use permit and building permit).

Design review considers building design, site planning, parking, landscaping, open space and other features that affect project appearance and function. In examining these features the design review process looks at the way a project relates to the site, the surrounding neighborhood, and the community as a whole. Design review is intended to help achieve a project that strikes a balance between the sometimes competing interests of the applicant and the City.

4.0 – SITE & DESIGN ANALYSIS

4.1 – Site Analysis

Exploring the sensory perception of a site is the first step in understanding the character of the place. This consists of documenting experiences that affect personal impressions as well as factual information: the influences of the wind, rain, sun and fog; the close and distant views of meadows, trees, and ocean; the sounds; the shape of the land; and the activity of wildlife. It helps to develop a narrative statement as to the most important aspects of place, both positive and negative. This documentation is most useful if it results from observations made at different times of the day and night, in different seasons, and in different weather conditions.

4.1.1 – Character of the Neighborhood

It is important to access the scale, apparent size and location of nearby homes and landscape; document materials and colors; understand how the neighborhood functions by locating neighbors' entrances, outdoor use spaces, and service areas; and determining how to preserve views, sunlight, and privacy of existing and future neighbors. Consider how a building complex on the site will affect the views from other homes, from the roads, and how it will contribute to the evolving landscape. The site analysis must include a photographic documentation of the site and its context, including adjacent land uses.

4.1.2 – Design Principals

The Sea Shell Estates design philosophy is based on the idea that building forms should evolve from an understanding of the three-dimensional relationship of the building to its specific site. This goes beyond two-dimensional plan view to consider all the senses that provide our experience of the environment. Successful building projects at The Sea Shell Estates will be developed from an understanding of the vocabulary of indigenous rural structures of the central coast, including the particular characteristics of the landform and the plant materials, and form a detailed architectural and landscape program identifying the needs and desires of the users. This section identifies the principals that will guide the form and siting of buildings at the Sea Shell Estates.

4.1.3 – Relationship to the Sun and the Wind

On the cool central coast, sunny and wind-protected places within and adjacent to the home provide opportunities for a more complete enjoyment of the site. The interior spaces that provide a sunny place for breakfast or a shaded place to read in the afternoon will enhance potential enjoyment, just as the form and orientation of the building can create sunny outdoor courtyards and terraces, protected from the wind, for year-round use. Solutions that integrate active and passive solar energy techniques are highly encouraged.

4.1.4 – Relationship to the Land

A building must respond to its specific location. Each site is unique, and buildings forms must develop from a thorough understanding of the particular place. A successful design can

reduce the impact of the buildings on the site and create a harmonious relationship with the neighborhood. Grading and vegetation removal should be minimized and existing natural features and topographic patterns should be preserved. Building forms should relate to the existing terrain and follow the natural slope of the ground. Stepping the floor levels to conform to the natural grade helps ground the building and creates a more appropriate relationship between the building and the site.

4.1.5 – Physical Form

The various elements of the project – structures, landscaping and fencing – should be seen as an integrated whole. The root forms, whether single of multiple elements, should be used to simplify and organize the structure. The building should be shaped to deflect the predominant wind flow, to create sheltered places, and to have roof slopes that blend with the natural slopes of the site.

Building materials and detailing should be simple. Many of the sites on the meadows are highly visible. The development of these sensitive sites poses a special responsibility for the owner and the designer. Building forms can merge with the landscape and/or reinforce an edge or boundary, but in general, they should not call attention to themselves. Simple, indigenous building forms that respond to the specific conditions of a site can provide the most appropriate fit with the immediate landscape, as well as the larger Sea Shell Estates community.

4.1.6 – Built Landscape Elements

The built landscape includes fences, walls, and minor structures as well as vegetation. Each of these elements, including proposed and possible future alterations or expansions, is an important part of the project. They should be considered at the time of the development of the design concept and integrated into the overall site plan – not treated as a cosmetic addition. Property boundaries should be de-emphasized.

Planted elements – trees and shrubs – grow. Therefore, consideration must be given to their potential for blocking views and their need for pruning in the future. The spaces adjacent to the buildings should flow from the site to the open space areas, minimizing the sense of separation. The existing landscape of most of The Sea Shell Estates already provides a "natural garden" setting. Planting can help connect the building to the site, but should not materially change the character of the existing setting. Plantings, including open space areas, must be selected from the approved plant list, except within enclosed courtyards where non-native plants are allowed, provided they are, and remain, screened from public view.

4.1.7 – Building Size

It is necessary to consider both the actual size and the apparent size of a building to properly integrate the building with its environment, making it subordinate to the landscape and in harmony with the neighborhood. The actual and apparent size of homes and additions must be considered in relation to the character of the site and the neighborhood context. If a building appears to overpower its surroundings and lacks cohesiveness with its neighborhood, a comparative bulk study with be required. Bulk shall be determined by calculating the gross square footage of the structure, including all living areas, garages, covered porches, breezeways, service structures and open decks 30 inches above grade. Buildings should blend with and not overwhelm their immediate surroundings. Failure to achieve this may result in denial of the project. The problem of size and fit within a neighborhood is as much an issue of apparent size as it is the actual square footage of the building.

It is possible to reduce the apparent size or bulk of a building by breaking up the mass of the building into several elements and/or increasing the integration of the building forms with the topography and landscape. Through careful planning and design, the apparent size of a home can be reduced without sacrificing its function or character.

4.2 – Design Review

Design review is not a static process but is based on balancing the traditions that have served the community well in the past with the evolving needs and building techniques for the future. This process benefits from the experience and observation of planning and design professionals who have worked with The Sea Shell Estates, as well as from the continuity of experience of City of Morro Bay Planning Department.

4.3 – Design Review Process

For new construction and major additions, the design review process will require the following:

- *A letter of Approval from the Design Review Committee demonstrating the consistency with the architectural Sea Shell Estates Design Manual prior to submittal of the Precise Plan to the City.*
- *City of Morro Bay Planning Commission approval in accordance with the Sea Shell Estates Design Manual.*

4.3.1 – Design Standards

The design standards establish the requirements for building on The Sea Shell Estates to maintain the character of the existing environment and preserve that character for present and future owners. The standards are concerned with all aspects of building development, from architectural and site design to the processes that take place during construction, remodeling, and maintenance.

5.0 – BUILDING CHARACTERISTICS

5.1 – Uses

No more than one residence shall be constructed on any lot; except for a secondary housing unit or "guest suite" as long as it is an integral part of the main residence and not a separate structure

5.2 – Siting

Topographical features, existing vegetation, adjacent structures, views and solar access must be considered in locating structures on the site.

5.3 – Height

The maximum allowed height at any point shall be measured from the highest natural grade adjacent to the highest point of the roof and not exceed a maximum of eighteen-feet-six-inches (18′-6″) (Refer to Figure 1). Vents, skylight enclosures, solar panels. chimney and other architectural features shall not exceed more than three-feet (3′-0″) above the restricted eighteen-feet-six-inches (18′-6″). Satellite dishes, outdoor furnishing and other appurtenances shall not exceed eighteen-feet-six inches (18′-6″). No structure shall obstruct or silhouette the ridge-line when viewed from the highway.

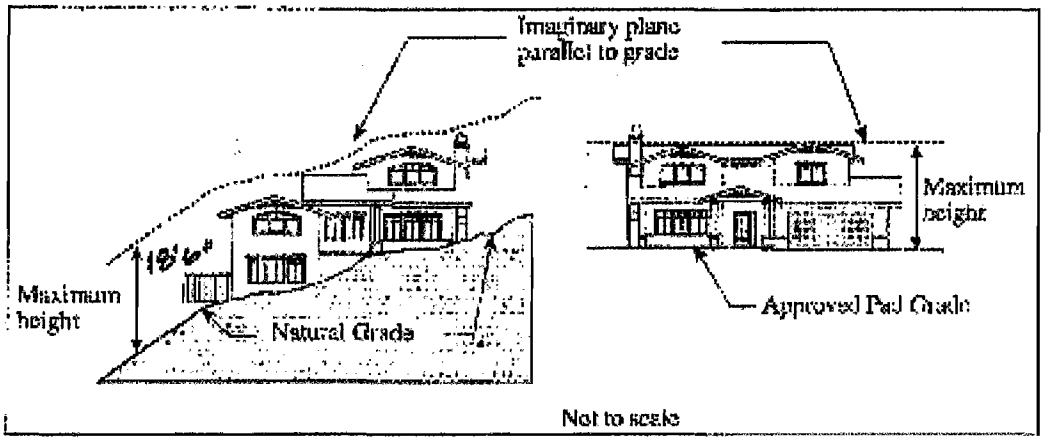

Figure 1: The maximum allowable height shall be measured as the vertical distance from the site grade to an imaginary plane located the allowed number of feet above and parallel to the grade.

5.4 – Vegetation/Landscaping

Trees and Shrubs are subject to the same height limitations as other improvements on the lot, (18'-6") and can be held to the height limit in those cases where they would otherwise block views and/ or shade a neighboring property. Each case will be considered on its individual merits. When vegetation does not obstruct views or light, it can merge and blend with other vegetation to enhance the character of the site and neighborhood. The maintenance of planted vegetation/ landscaping in the common and open space areas will be done in accordance with the approved maintenance agreements approved with the Tract Map and CC&R's. The maintenance of plant vegetation/ landscaping in the "private 1,000 and 2,000 square foot yard areas" is the responsibility of the owner. Herbicide use within the Building Envelope shall be restricted to environmentally friendly varieties.

5.5 – Size and Bulk

The actual and apparent size of homes must be considered in relation to the character of the site and neighboring context. If a building appears to overpower its surroundings and lacks cohesiveness with its neighborhood, a comparative bulk study will be required. Buildings should blend with and not overwhelm their immediate surroundings. Building footprint including garage and ancillary structures except patios (see Section 5.6.1 and Section 5.6.2 for further details) shall not exceed three-thousand-six-hundred (3,600) square feet. Second story floor area shall be limited to 75% of the first floor area. Failure to achieve this may result in denial of the project.

5.6 – Building Setbacks

The City of Morro Bay Zoning Ordinance establishes setback lines from the property line, however in this case; the minimum setback for each lot shall be the building envelope line as set forth in Tract Map 2870.

The front yard setback will be twenty (20-0") feet minimum measured from the back of street paving for each lot. The side yard setbacks will be a minimum of five (5'-0") feet from the property line for each lot. The rear setbacks vary for each lot. See attached Exhibit #1 for individual rear setback locations.

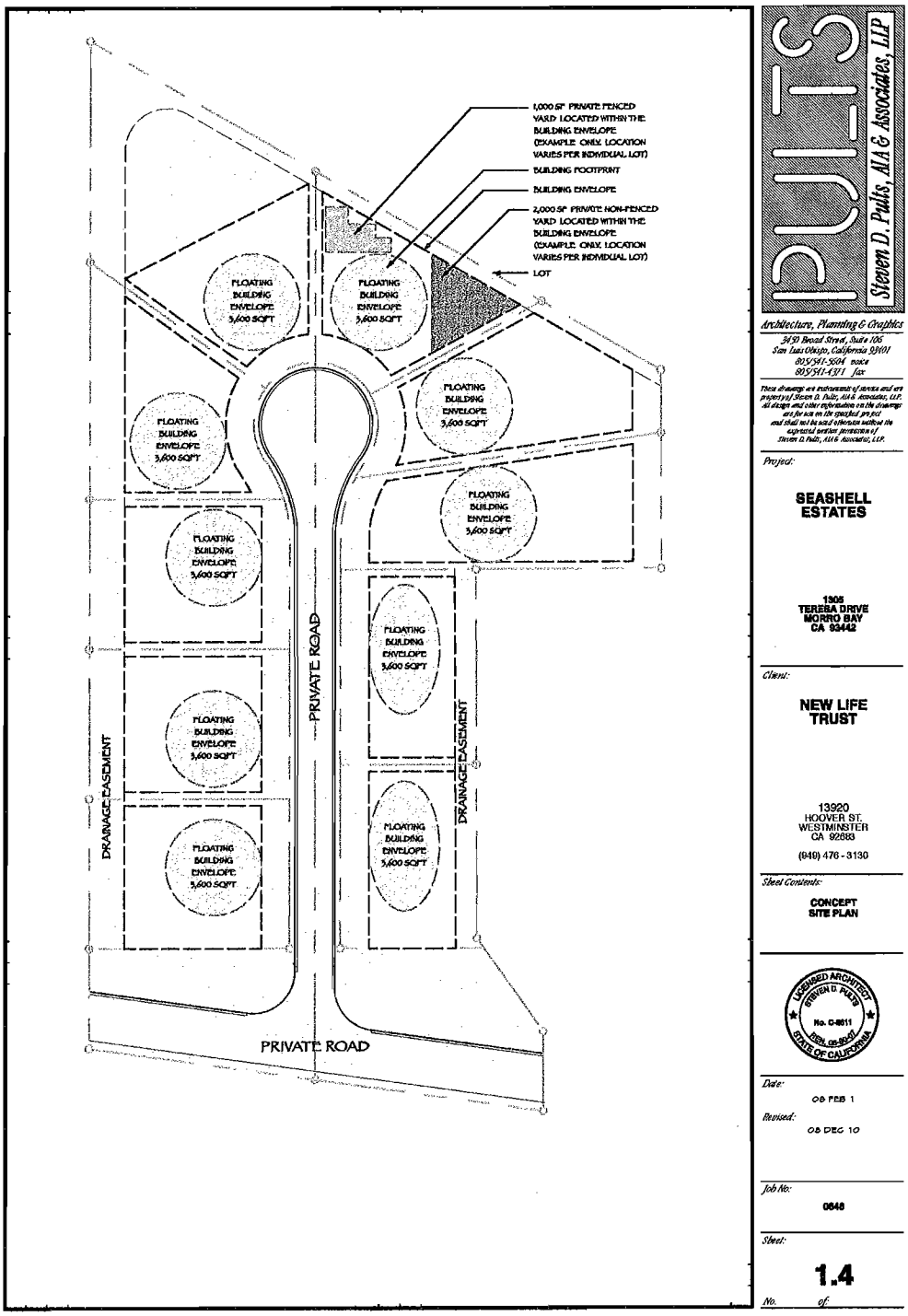

Figure 2: Building Envelopes, Building Footprints, Setbacks, Private Fenced and Non-fenced Areas
See Appendix 1: Sea Shell Estates Tract No. 2870 for Rear Setback Locations

5.6.1 – Private Yard Fenced Areas

In each lot of The Sea Shell Estates, portions of individual lots may be designated as "Private Fenced Yard" areas. The private area shall be for the exclusive use of the owner. A maximum

fenced area of one-thousand (1,000) square feet is allowed but shall be placed on the north side of the home as to be enshrouded from the view of Highway 1. Fences, retaining walls, decks, patios, walkways and landscaping are permitted in these areas. No play structures and storage is to exceed the height of any fence.

5.6.2 – Private Yard Non-Fenced Areas (Within the Building Envelope)

Landscaping , stepped low retaining walls, uncovered at grade decks, patios, stairs, landings, and walkways (not to exceed thirty inches (30") in height) are permitted in these areas and shall be an integral part of the open space area. All landscaping shall adhere to the Design Manual's approved Plant Palette. Fences are not allowed. Parking, Play structures and storage are not allowed.

5.7 – Parking

Each site shall contain parking spaces for at least two automobiles, which shall be in a garage and at least one exterior space for guests. The size of parking areas should be kept to a minimum to lessen the visual impact on the site. The following are proposed and not limited to help visually concealing automobiles.

- *A garage attached or detached from the home*
- *A carport enclosed on not less than two sides, either attached directly to the main residence or connected by a roof or fence*
- *An exterior parking area enclosed on not less than two sides by a fence with a minimum height of 5 feet, and/or vegetation or planted berm*
- *An exterior parking area not visible from neighbors or the road*

5.8 – Lighting

The light source of any exterior lighting fixture shall be shielded and not be visible from streets, or neighbor properties. Exterior lighting may be used to light paths, walkways, and entryways to provide for convenience and safety, but the light source must be shielded in a manner to avoid excess illumination of buildings or the site. Exterior holiday lighting and decorations must be considered with care to avoid a negative impact on "up-slope" neighbors.

Care must be taken during the design process to ensure that fixed interior lighting is shielded or located so as not to shine directly into roads, or neighboring homes. Care should also be exercised to avoid negative impacts of light from windows, skylights, and clerestories, particularly in terms of the impact on "up-slope" neighbors.

5.9 – Signs

Personal noncommercial signs, posters, flags, or banners, on or in the owner's private area are allowed in accordance with the California Civil Code. No other signs shall be permitted except home address identification numbers, "job identification" signs and "for sale" or "for rent" signs. The Sea Shell Estates maintains standard home number, "for sale," or "for rent" sign formats to be used by all owners. Construction-related signs shall be limited to two per site and a maximum area of six square feet, and shall be of earth-tone colors or black and white.

5.10 – Service Areas

Fuel tanks, garbage containers, and similar services equipment shall not be visible from the neighbors' properties or from the road and shall be contained in an enclosure that is

constructed as an integral part of each building. Trash containers must be inaccessible to wildlife.

5.11 – Temporary Construction Facilities

No trailers, recreation vehicles, permanent tents, or similar structures shall be constructed, placed, or maintained upon any private area prior to construction of the main structure or a residence provided, however, that the provisions of this paragraph shall not apply to temporary construction facilities maintained during, and used exclusively in connection with, the construction of the residence and be not for residential purposes.

5.12 – Vehicle and Boat Parking

Parking areas for all vehicles – automobiles, trucks, truck campers, trailers, or boats of any kind must be adequately screened from neighboring property and roads.

5.13 – Recreation Vehicles and Mobile Homes

No recreation vehicles, travel trailers, or mobile homes shall be kept, placed, or maintained upon any private area at any time unless they are totally enclosed in a structure that is in scale and character with the home and site.

5.14 – Penalties for Violations

No person shall violate, or fail to comply with, any provision or requirement of this document. The violation of any provision of this document, any ordinance of the city or of any code adopted by reference in this document, by any person is unlawful, and is punishable by fine.

6.0 – SITE DEVELOPMENT

Site grading and management of site drainage is a major community concern. As the amount of runoff from building development increases, downstream erosion and habitat protection becomes more critical. There is a great need for all owners to accept their roles in the overall protection of The Sea Shell Estates environment.

The general requirements are listed below. In the review process, because of the uniqueness of each site, the City may grant variances to the standards or require more restrictive solutions if, in its judgment, the design solution or site circumstances or a particular project warrant such changes.

Approved final plans and a City of Morro Bay building permit are required before the storage of any building materials or any grading on the site per City standards.

6.1 – Grading and Drainage

Since it is expected that the design of the home will be tailored to the site, not the site to the home, excessive lot grading is discouraged and usually not allowed. However, since generalized solutions may not be appropriate to all site conditions on The Sea Shell Estates, unique solutions may be allowed in specific cases.

Appropriate grading will:

- *Minimize site disturbance*
- *Retain the maximum amount of undisturbed topsoil*
- *Avoid major excavation*

- *Avoid significant engineered cut and fill slopes*
- *Avoid creation of depressed floor areas or low areas of poor drainage that will negatively impact existing vegetation, impede growth of new planting, or create future drainage problems*

6.2 – Grading and Drainage Information

A site grading and drainage plan at scale of 1/8 inch equals one foot, based on a topographic map by a licensed surveyor, will be required as part of the Design Review submittal. This plan shall indicate existing and proposed contours at one-foot intervals, location of all proposed and existing improvements, location of all existing trees with a height of over six feet and a diameter of over six inches, prominent shrubs, trees to be removed, and the location of proposed utility installations.

6.3 – Grading and Drainage Plan

The grading and drainage plan shall also include the limits of site disturbance, the line of tops and bases of all cuts and fills, pitch direction of graded parking and yard areas, and direction of drainage swales. Collected storm water runoff may not be directed onto neighboring property. Runoff shall be directed and conveyed to tract drainage system and detention basin.

6.4 – Finished Grade

The grading and drainage plan shall demonstrate that finished contours blend naturally with the existing adjacent topography.

6.5 – Grading on Open Space Areas

No excavation, fill or change in natural or existing drainage is permitted within the open space, access and drainage easements.

6.6 – Erosion Control

Erosion Control features and materials must be described on an erosion control plan for the construction period and for the completed project.

6.7 – Soil Management

During Construction, soil disturbance shall be managed as follows:

- *Topsoil removed from building footprint and areas to be paved should be stored on site for reuse*
- *Subsoil lacking humus should not be used to cover topsoil*
- *Excess subsoil should be removed from the site*
- *If soil removal is necessary, subsoil should be removed first. Retail the best quality soil for reuse on site*
- *Where soil is to be stored on site for reuse, the placement area must be prescarified, rototilled, or otherwise softened to ensure downward soaking of rainwater to undisturbed soil levels*
- *Soil should not be spread over existing vegetation to avoid soil removal*

6.8 – Site Protection During Construction

Any grading within the drip line of any tree with a caliper of six inches or larger is prohibited without prior approval of the City of Morro Bay. A construction fence must be installed at the drip line. Storage of materials, parking of vehicles or equipment, or any other construction-

related activities within the fenced area is prohibited. Fence locations and descriptions of the types of foundations, fence posts, and materials must be shown on the site plan. Major shrubs or shrub masses are to be retained and will require protection to avoid construction impacts. Repeated parking or driving vehicles and other construction equipment outside the planned driveway, parking court, and building footprint is prohibited unless it is infeasible for construction to otherwise occur.

6.9 – Water Runoff

Construction that obstructs, fills, or changes the coursing of water shall be the owner's responsibility to remediate. Such remediation shall consider the adjoining properties, including the open space areas. Any and all defects created by the property owner shall be that property owner's responsibility to remediate without cost to The Sea Shell Estates. Runoff concentrations must be avoided. Water at the outlets of day-lighted drain lines must be distributed into French drains, stone-filled sumps, subsurface leach lines, or other similar energy dissipaters. Directing runoff to neighboring properties is prohibited.

6.10 – Re-grading

Re-grading areas and berms must be sloped in a gradual fashion to reduce the apparent height of walls and buildings and to create the appearance that the re-graded areas are a natural extension of adjacent undisturbed grades.

6.11 – Re-planting

All re-graded and disturbed areas shall be replanted with The Sea Shell Estates approved grasses and/or shrubs and trees (found in the attached Plant Palette) to blend in with the adjacent landscape.

6.12 – Construction Site Control

No fill, construction debris, or building materials are to be located on adjacent properties, right-of-way, open space areas, or roadways. The building site must be kept clean and orderly, and blowing dust and sand must be controlled throughout the period of construction.

6.13 – Accessory Buildings

No accessory buildings shall be placed on a lot prior to construction of the main residence, unless such building is used only as a temporary construction shelter. A temporary construction shelter must have a neutral, non-reflective finish with no advertising.

6.14 – Portable Toilet

A portable toilet of the type approved by the city of Morro Bay shall be specified in the building plans and located on the building site during the course of construction. Preferably it shall be a muted color and be located so as to be unobstructed.

6.15 – Vegetation Management

Simple plant elements that are a integral part of the open space area are to be used in conjunction with the approved plant palette to help reflect to the natural environment of the site.

6.15.1 – Fuel Management

Fuel management is a critical problem for fire safety at The Sea Shell Estates. Vegetation removal and trimming to maintain a private area in a fire safe condition per the requirements of Public Resources Code section 4291 is allowed. Owners are encouraged to contact the city of Morro Bay Department of Planning and Building and the Morro Bay Fire Department for recommendations on fuel management in private areas.

6.15.2 Protecting the Open Space Areas

Providing open space and integrating natural features into a residential project can significantly increase the appreciation of residents in their neighborhoods, provide safe places for children and families to play, and maintain a strong sense of connection with the surrounding natural environment in the city as a whole.

An owner is prohibited from removing, destroying, or altering any vegetation within the conservation open space areas unless the removal of vegetation from any such area is done in accordance with The Sea Shell Estates Procedures outlined in Section 8 - Landscaping. This does not include the "private 1,000 or 2,000 square foot yard areas".

6.15.3 – Protecting Existing Vegetation During Construction

As part of an application for new construction or for a major addition, the City may require a plan to protect vegetation on the site during construction or to restore the site vegetation after construction. To protect the site during construction, the City may restrict construction to a reasonable portion of the lot so that the maximum amount of natural vegetation can be retained and may require the installation or temporary fencing for the protection of designated trees, shrubs, and/or areas of the site that should remain undisturbed.

6.16 – Driveways

Accommodating vehicle storage in residential projects should avoid the common problem of creating streets that appear garage-and driveway-dominated. The maximum width of a driveway shall not exceed twenty-feet (20'-0"). The maximum driveway area per lot shall be 1,200 square feet.

Driveways shall be the same width as the curb openings, not including the transitions. Unless authorized by the city engineer, property owner, adjacent property owner and the Public Services Director. The driveway ramp and transition must lie entirely in front of the property served. The fire department may require greater driveway widths to allow for proper emergency vehicle access.

6.16.1 – Driveways – Location

Driveways should be located with consideration for safety of access to and from main roads, ease of grade, minimal destruction of vegetation, and minimal disturbance of site. Lot owners that need to remove existing landscaping to install a driveway shall replace or relocate the existing landscaping along the street frontage. All driveways shall require an access easement over the Open Space Area at time of construction.

6.16.2 – Driveways – Surface Material

Gravel or other approved porous driveway surfaces are required unless the slope or other special conditions require paving per City regulations.

6.16.3 – Curb Cuts

Necessary curb cuts shall be satisfactorily repaired to conform to City standards.

7.0 – ARCHITECTURAL ELEMENTS

The "holistic image" of The Sea Shell Estates was established by creating a vocabulary of ideas about the design, materials, and construction that are appropriate. Architectural elements include building form and size, openings, materials, and finishes as well as Architectural details.

When viewed in the context of an individual building, many elements, such as the height of fencing, the scale of entryways, or the color of window sashes are seemingly minor design issues, but when viewed as part of the larger context, they are important in establishing and maintaining the character of the place. Buildings must respond to The Sea Shell Estates community at large as well as to their specific sites. The impact of wind, rain, and sun over many years takes its toll on the materials and finishes of buildings. The City is aware of the changing availability and the declining quality of traditional building materials, and energy-efficient building systems. Because of the uniqueness of each site, the City may allow variations or require more restrictive solutions than those listed below.

7.1 – Roof Design

Simple roof elements that are a coherent part of the building form are to be used with roof slopes that reflect to the natural slope of the site.

7.1.1 – Roof Slope

Roof slopes are a product of the type of roof and building width. A 5-in-12 or less roof pitch is allowed.

7.1.2 – Permitted Materials

Permitted materials include: asphalt or composite flat shingles, in black or dark earth tones without pattern or excessive texture; dark tone, non-reflective metal and earth sod. The exploration of new and alternate materials is encouraged. These materials will be considered on an individual basis, with adequate evidence of proven use and/or testing and aesthetic compatibility. Specifications and/or samples of roofing materials must be submitted to and approved by the Design Review Committee prior to submitting to the City for approval.

7.1.3 – Flat Roofs

A flat roof may be sheathed with a "built-up" roofing system – but only if approved by the City. The size of crushed rock materials must be uniform and the color must be approved by the City.

7.1.4 – Fire Rating

Roofing materials must conform to Class 'A' fire rating as approved by the city of Morro Bay. If repairs constitute more than 50% of the roof area and the roof is not a Class 'A' roof system, the entire roof must be replaced with a Class 'A' roof system.

7.1.5 – Vents

Roof vents require care in placement, orientation, and design to maintain the visual order of the building. It is often possible to group vents to avoid a cluttered roofscape.

7.2 – Exterior Walls – Materials

Redwood or cedar siding board and wood shingles are allowed as an exterior siding material at The Sea Shell Estates. The exploration for use of alternative materials, either natural or manufactured is encouraged. New and/ or alternate materials will be considered on an individual basis, based on compatibility with the visual vocabulary of The Sea Shell Estates and adherence to finish, color, and reflective requirements. Colors shall follow the San Luis Obispo County approved Munsell Book of Color. Colors shall be earth tone, muted and create a synthesis with the surrounding landscape. Material and color samples shall be submitted to and approved by the Design Review Committee prior to submitting to the City for approval.

The Munsell book of Color displays 1181 color chips, arranged according to the Musell Color-order system. Each page represents one hue, and there are 40 pages, 2.5 hue steps apart. On each page, the chips are arranged by Munsell value and chroma. Value increases from the left to right in increments of 2. The Munsell hue is printed at the top of each page. the value steps are printed on a vertical scale at the bottom of the page.

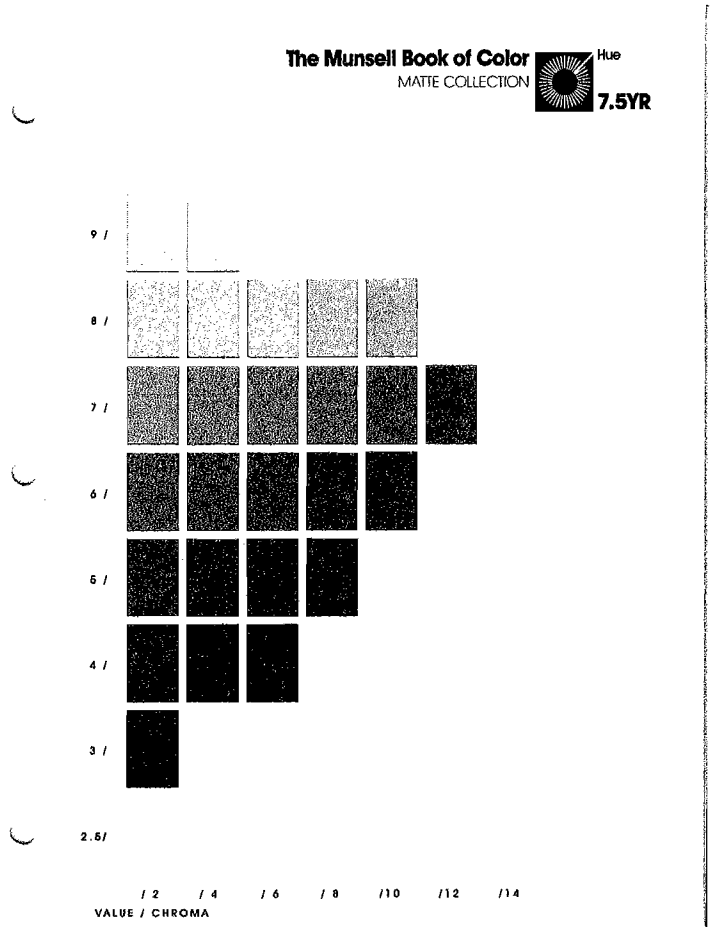

Figure 3: Example of Munsell Book of Color

7.2.1 – Foundation Walls

Siding shall be designed to come to within six (6) inches of and be parallel to the finished grade. Exposed concrete stepped foundations, as part of an integrated design will be considered on an individual basis in terms of appropriateness of the relationship of the overall design of the structure to the landscape.

7.3 Utility Infrastructure

All utility infrastructure shall be submitted and approved by the Design Review Committee. Power switch boxes shall be recessed unless otherwise approved by the City and Design Review Committee. Gas meters shall not be concealed from any structure and shall be visually screened. The access door shall be flashed and constructed of the same material as the adjacent siding.

7.4 – Windows

Windows are an important element in determining the character and livability of a home. They provide a connection to the outside – to close and distant views. They can extend the apparent spaces beyond the walls, provide ventilation, and allow sunlight in to enrich and define the interior spaces. Thoughtful design and location of windows can provide both views and the preservation of privacy.

Window openings should be considered as part of the three-dimensional development of the interior space responding to the building program, not as an afterthought merely chosen from a catalog or only as a response to the exterior composition of the building. The scale (apparent size) of the building will be affected by the size and arrangement of windows and how the windows fit into the wall. With the exception of board-and-batten design, windows should be integrated into the walls without trim.

7.4.1 – Shape

Window shapes should result from their function – to focus views, to extend spatial relationships, and to bring in light – not just as elements on the exterior walls. They should relate to the character of the building and be integrated with it, not stand out in contrast. Simple windows forms responding to their use are almost always the most appropriate.

7.4.2 – Glass

Mirrored Glass is prohibited; clear glass is preferred. Some high-efficiency, lightly tinted glass materials may be acceptable, but samples must be submitted for review along with the appropriate specifications and drawings.

7.4.3 – Coverings

Interior window coverings are inescapably visible from the outside of homes, and brightly colored curtains and blinds have a visually disturbing impact on the community. Beige or subdued earth-tone colors are recommended.

7.4.4 – Ventilation

To prevent excessive heat build-up in warm weather, operable windows should be provided for cross ventilation.

7.5 – Skylights

7.5.1 – Materials and shape

Skylights should be flat, clear glass, or polycarbonate (or similar) panels placed parallel to the roof plane. "Dome" or other three-dimensional shaped skylights or skylights with white or other earth tone colored glazing materials add unnecessary complexity to the building form, may create light-fall problems for neighbors, and are not permitted.

7.6 – Solar Collectors

The use of active and passive solar design systems is encouraged.

7.6.1 – Location

Solar collectors and attendant attachments (fasteners, pipes, power lines, and so on) must be thoroughly integrated with the overall building and roof forms.

7.6.2 – Materials

Materials that minimize reflectivity are preferred. The collectors and related materials must be properly integrated with the overall building and roof forms.

7.7 – Finishes

Exterior surfaces, trim, and siding should normally be treated for weather protection. Colors and methods of application will be controlled to achieve neighboring continuity. Decisions by the City for permitted use will be based on the specific case related to the material, location, neighborhood compatibility, and the visibility from neighboring homes and public areas. Finish material samples will be submitted to and approved by the Design Review Committee prior to submitting to the City for approval.

7.7.1 – Finishes – Approvals

All exterior colors and materials will require approval by the City and must be submitted on a sample of the actual building material, with the method of application clearly stated. A test area of the application on site may be required prior to full application. All colors and materials will be submitted to and approved by the Design Review Committee prior to submitting to the City for approval.

7.7.2 – Finishes – Window Frames

Windows are a major element in the visual character of a home, and they should blend in with the walls – not stand out in contrast to them. Window Frame colors shall follow the San Luis Obispo County approved Munsell Book of Color. Only muted earth tone colors will be allowed for window and skylight frames. Material and color samples shall be submitted to and approved by the Design Review Committee prior to submitting to the City for approval.

7.7.3 – Metal Work

Flashing, metal work, vents, gutters, and trim must be non-reflective and finishes with the same color as the adjacent siding or roofing to avoid contrast.

7.7.4 – Reflective Finishes

Other than glass and hardware, reflective finishes are not allowed on any exterior surface.

7.8 – Fencing

Fencing is not allowed except for the 1,000 square foot private yard. Because of the natural character of the site or the relation to the character of the neighborhood, fencing may have a greater impact and will require special care. Fencing location, design and materials must be submitted to and approved by the Design Review Committee prior to submitting to the City for approval.

7.8.1 – Use of Fencing

Long term parking areas and all above-grade service facilities, including trash and garbage containers, maintenance and service equipment. Clothes lines must be screened with fencing or a combination of fencing and plant materials. Trash and garbage enclosures must be animal proof and placed to allow for convenient pick-up from the road. Fences may also be used to define and screen private courtyards and gardens from public view. Gates used to close off parking areas require approval from City.

Fences may not be used to define the perimeter of a lot or large portions thereof. The use of fences to define areas for private use should be limited. Privacy screening by the use of combination of fences and vegetation is preferred.

7.8.2 – Height

The height of fencing shall not exceed six (6) feet above adjacent grade. On some sites, the apparent height of fencing can be reduced by the use of landscape elements or by the use of gently sloped berms extending to the top of a retaining wall and then topped by a low fence.

7.8.3 – Visual Impact

The scale and placement of fences are important to the visual composition of the total building complex. When fences are used as integrated extensions of buildings to define entrances and courts, they should be constructed of the same materials as the buildings. The extent and visual impact of fencing should be minimized. Typically, fences should have no caps. However, fence caps may be used when they are extensions of deck railings or other architectural features.

7.8.4 – Relation to Grades

In general, fencing should follow the contours of the land, however, tops of fences should be level and stepped to follow the grade.

7.9 – Deck Railings

Deck railings may be solid or open and must be appropriate to the character of the building. Railings may be constructed out of any suitable material and finished in muted earth-tone colors and shall be non-reflective. Deck railing colors shall follow the San Luis Obispo County approved Munsell Book of Color.

7.10 – Hot Tubs

Hot tubs and spas must be located and screened from view in such a way that their use provides no intrusion on neighboring property, open space areas, or public areas. Heights of the screening enclosure must conform to applicable safety requirements and must be a minimum of six (6) inches above the top of the hot tub or spa enclosure.

7.11 – Antennas

Antenna and satellite dishes are subject to applicable regulations of the Federal Communications Commission (FCC). Owners are encouraged to review the installation of antenna and satellite dishes with the city of Morro Bay Department of Planning and Building Department.

7.11.1 – Visibility

Antennas, including satellite dishes, should be installed so that they do not project above the ridgeline of the roof of the structure. Installation should minimize the visibility from neighboring properties and roads. The color of satellite dishes should match the color, as closely as possible, of that part of the structure on which they are mounted.

8.0 – LANDSCAPE ELEMENTS

The Sea Shell Estates landscape includes a rich diversity of indigenous plant types (refer to the attached Preliminary Plant Palette) as the terrain extends through the site. The mixture of varied, and the success of each plant type is a result of its suitability to the terrain, soil conditions, available moisture and wind. The common pattern is random, a mix of grassy meadows intertwining with forest trees and riparian corridors. The orderly cypress hedgerows are a unique and valuable exception that is part of The Sea Shell Estates landscape history and image. The goal of The Sea Shell Estates planning is to maintain, restore and reinforce the native landscape. The flow of vegetation and landforms to and between buildings is an important part of that concept. Personalized gardens incorporated non-indigenous plant materials may only be developed within enclosed courtyards.

Some plant materials, such as Monterey Pine, are not local natives, but over the decades have naturalized and appear to be part of the regional natural landscape. Generally, however, non-indigenous plants in The Sea Shell Estates landscape are ill suited to the character of The Sea Shell Estates and are not allowed outside of screened courtyards. Non-supporting plant materials or plants arranged in a formalistic pattern are not consistent with the overall concept of supporting the natural setting of The Sea Shell Estates, in terms of plant association and imagery.

The constructed elements of the landscape must also be compatible with The Sea Shell Estates image. Walls, steps, and graded slopes are an important part of site development and must be designed as part of the overall plan for the project. Such constructed elements must use materials and building techniques that blend with the existing landscape. The City may require landscape solutions other than those listed below depending on the characteristics of the specific site.

8.1 – Landscape Design

Landscape designs should be simple rather than complex, natural in appearance, and free of artificial appearing geometric patterns, such as evenly spaced, straight rows or trees or shrubs along driveways or property lines. A detailed landscape plan identifying plant materials and locations of proposed vegetation must be submitted to and approved by the Design Review Committee prior to submitting to the City for approval.

8.2 – Relation to Site

The design of the landscape for individual homes must be consistent and blend with landscape character of the site and the adjacent open space areas. Landscape planting, even in limited quantities, can help achieve a visual connection between the building and the site.

8.3 – Plant Selection

Variety in plant selection and size can maintain the visual diversity present in the natural landscape. A diverse pattern rather than a monoculture leads to a healthier and more successful landscape design.

8.4 – Walls and Steps

8.4.1 – Design and Materials

Landscape walls and walls relating to stairs adjacent to a building shall be sheathed in the same material as the building. Step railing, where required, must conform to safety requirements, but should be simple and visually unobtrusive rather than a dominant design feature.

8.5 – Local Materials

Walls of local stone or veneer may be appropriate for the construction of retaining walls.

8.5.1 – Pavement

The design of paved areas and the paving materials must reinforce and blend in with the rural character of the site and de-emphasize an urban or suburban appearance.

8.5.2 – Drainage

Porous pavements are required rather than poured concrete or asphalt-based materials. Porous pavements permit rainwater to be absorbed into the soil, decreasing the quantity of runoff and consequent downgrade problems. At times, site conditions require the use of non-porous materials, but their use should be well reasoned and limited. Grading and drainage plans are required for all paved areas.

8.5.3 – Materials

Materials such as paved surfaces of decomposed granite, compacted drain rock or gravel, fir bark mulch, and stepping-stones of wood or stone are suitable materials for landscape walks and terrace areas. Unit pavement materials placed over base materials of drain rock and sand may be suitable substitutes for concrete. Some types of pre-cast pavers may be suitable for use at The Sea Shell Estates, but most are urban in character and inappropriate.

8.6 – Lot Line Definition

Delineation of lot lines with fences or planting is not allowed. Lot boundaries serve a legal purpose, but they are visually unimportant in an open landscape like The Sea Shell Estates. A lot line made visible by rigid planting patterns, clearing, or mowing to the edge establishes a suburban look as precisely as a fence and denies the open-space philosophy underlying The Sea Shell Estates.

8.7 – Plant Materials – Preservation of the Landscape

Native vegetation should be managed, restored, and replaced to the extent possible in areas damaged during construction. The landscape plan must indicate areas to be protected as well as any new planting.

8.8 – Landscape Design

The design of new landscape must be informal and simple. All exterior landscape planting must be native or indigenous (except in private fenced areas) and should reflect species found naturally in the neighborhood. Eye-catching planting using non-indigenous plants are not acceptable.

8.8.1 – Plant Types

Excessive areas of a single plant type in a geometric pattern which by the dominance of foliage or flowers detract from the natural surroundings should be avoided. Placement of large shrubs and trees should be made judiciously. They must be considered as elements of the total composition along with the mass of the building and related components, and will require continuing maintenance. An approved plant list is available and attached to The Sea Shell Estates Design Manual.

8.8.2 – Heights and Views

Planting must not impede neighbor's views or important views from the neighborhood roads. Future growth must be considered in the selection of plant materials. Vegetation height maintenance is the responsibility of the owner. Taller trees and shrubs may be required to help screen the house from views from the Highway. The final size and location of the screening landscape shall be submitted to and approved by the Design Review Committee prior to submitting to the City for approval.

8.8.3 – Non-Indigenous Planting

Plants located completely within enclosed courtyards and not visible from any neighboring properties or roads may deviate from the approved plant list. However, they must remain screened from public view. Plants selected should be appropriate to the central coast environment. Invasive non-native plants capable of spreading by seed, root growth, or runners are prohibited and must be replaced by the homeowner.

8.9 – Fire and Tree Management

Maintenance of existing plants and the locations of types of new plantings must respect fire management regulations. Please refer to Public Resources Code section 4291, the San Luis Obispo County Department of Emergency Services section 1359.5, California Division of Forestry, and related Sea Shell Estates management policies as to types of plants, location requirements, and management practices.

8.10 – Meadow Grass

Management of meadow grass is required for fire protection. However, care must be given to the way that grasses are mowed. Cutting grasses too short simulates a suburban lawn-like appearance, allows invasive plants to become established, and is detrimental to the regeneration of native bunch grasses. The shape of the mowed area should be random. Mowing strictly along the property line or in a rectilinear pattern emphasizes the shape of the parcel and negates the visual continuity of the meadow.

8.11 – Tree Management

The possibility of damage from falling trees due to storms and/ or disease should be assessed, and when there is a potential concern, an analysis by a professional arborist should be obtained. Refer to The Sea Shell Estates Procedure for Vegetation Removal and wind throw studies for information on the management of trees.

8.12 – Nesting

Migratory and ground nesting birds have been observed in the area. In order to ensure that there are no conflicts with these or special status birds, maintenance and construction work will follow the approved Biological Mitigation Measures set forth in the Tract Map 2870 conditions or approval. If for any reason a property owner is unsure of the appropriate Mitigation Measures, the owner should consult with a local qualified biologist.

Appendix 1: See attached Sea Shell Estates Tract No. 2870

Appendix 2: Plant Palette

PRELIMINARY PLANT PALETTE
Seashell Estates, Morro Bay, California
August 20, 2007

Notes:

1) Due to the very shallow soil depth and extreme nutrient deficiency characteristic of serpentine soils, landscape areas for plants at homesites will require significant amendments and planting soils incorporated in the planting process.

2) Tree sizes estimated at 10 to 15 year maturity, depending on growth rate & size at planting.

3) The serpentine soil on site, per the Biological Screening Report, appears "to have been exposed reently and have not yet had time to develop as suitable substrate for these (indigenous) plants". The introduction of sensitive serpentine plants to the Transition Zone on site will require incorporating amendments to the substrate. The amendments may be part of the hydroseed mix to reintroduce native grasses followed by planting nursery plugs for the shrubs, perennials, and forbs.

Botanical Name	Common Name	Evergrn Decid.	Size HxW	Comments
LANDSCAPING PLANTS FOR DEVELOPMENT LOTS (HOME SITES) (California plants native to or adapted to the Morro Bay climate, with ornamental value.)				
TREES				
Cupressus Sargentii	Sargent Cypress	E	30' x 15'	Foliage is dull green, found on serpentine
Pinus contorta	Beach pine	E	8'+ x 6'+	Very good small pine, easily pruned for structure
Pinus radiata	Monterey pine	E	35' x 20'	Fast and tall, good screen when young
Platanus racemosa	Clifornia sycamore	D	25' x 30'	Excellent for shade & riparian character
Populus fremontii	Western cottonwood	D	20' x 15'	Fast and tall, good screen and shade tree with fluttering leaves, riparian
Quercus agrifolia	Coast live oak	E	25' x 30'	Good shade tree
Umbellularia californica	California bay	E	25' x 18'	Good foliage tree, herbaceous scented leaves
SHRUBS, PERENNIALS, GRASSES				
Achillea millefolium	Yarrow		0.7' x 1'	Very drougth tolerant, showy summer flowers
Agave shawii	Coastal agave		4' x 5'	Succulent, bold form
Allium haematochiton	Red skinned onion		0.5'x0.5'	Wild native onion
Arctostaphylos cruzensis	Arroyo de la Cruz manzanita		0.5' x 3'	Coastal manzanita for ground cover use
Arctostaphylos morroensis	Morro manzanita		2.2' x 3'	Shrubby manzanita, gray green foliage,spring white to pale pink bloom
Arctostaphylos obispoensis	San Louis Obispo manzanita	E	3' x 3'	Local native, gray green foliage, white flowers
Arctostaphylos pechoensis	Pecho manzanita	E	1' x 1.5'	Low growing, adapted to serpentine soil
Artemisia californica	California sagebrush	E	4' x 3'	Pungent grey green leaves
Artemisia californica 'Canyon Grey'	Trailing sagebrush	E	0.5 x 0.7'	Ground cover form, grey green
Baccharis pilularis	Coyote brush	E	3' x 6'	Fresh green foliage, early summer clover scented bloom
Baccharis pilularis 'consanguinea'	Lowly coyote brush, magenta sprir	E	0.5'x3'	Low growing ground cover form
Baccharis pilularis 'Pigeon Point'	Dwarf coyote brush	E	1' x 3'	Low growing ground cover form
Calystegia subacaulis ssp.espiscopalis	Morning glory	D	2.5'x2'	Native to Morro serpentine areas

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2) Tree sizes estimated at 10 to 15 year maturity, depending on growth rate & size at planting.

3) The serpentine soil on site, per the Biological Screening Report, appears "to have been exposed reently and have not yet had time to develop as suitable substrate for these (indigenous) plants". The introduction of sensitive serpentine plants to the Transition Zone on site will require incorporating amendments to the substrate. The amendments may be part of the hydroseed mix to reintroduce native grasses followed by planting nursery plugs for the shrubs, perennials, and forbs.

Botanical Name	Common Name	Evergrn Decid.	Size HxW	Comments
Carex obispoensis	Obispo sedge	E	1.3'x1'	Grass like sedge, fresh green
Carpenteria californica	Bush anemone	E	4' x 3'	Showy camellia like white flowers late spring
Ceanothus impressus 'nipomoensis'	Arroyo Grande lilac	E	2' x 3'	Pale blue flowers attract bees & butterflies
Ceanothus thyrsiflorus	Coastal mountain lilac	E	2.5'x3'	Pale blue flowers attract bees & butterflies
Cercis occidentalis	Western redbud	D	8' x 6'	Large accent shrub
Clematis pauciflora	Clematis	D	3' x 8'	White flowers in spring
Diplacus aurantiacus 'lompocensis'	Lompoc monkey flower	E	1' x 1'	Showy summer apricot yellow flowers
Dudleya abramsii 'murina'	San Luis Obispo Live Forevery	E	0.2 x 0.5	Succulent, sivler gray, plant in masses
Encelia californica	California sunflower	E	1.5' x 1.5	Bring green leaves with daisy like yellow flowers
Eriogonum fasciculatum	California buckwheat	E	1' x 1'	Abundant summer flowers in mauve color
Eschscholzia californica	California poppy	annual	1' x 1'	State flower, bright orange poppies in spring
Fremontodendron 'California Gold'	Flannel bush	E	6' x 5'	Deep yellow bloom in late spring, gray green leaves
Helianthemum scoparium	Sun rose	E	0.2'x0.5	Showy yellow & orange flowers on low mat
Heteromeles arbutifolia	Toyon, Christmas berry	E	6'+ x 6'+	Showy red berries in late fall and winter
Heuchera maxima	Island alum root (coral bells)	E	1' x 1'	Showy stems of coral, pink & red spring flowers
Iris douglasiana	Douglas iris	perenn	1' x 1'	Native iris with many hybrids
Lavatera assurgentiflora	Malva rose	E	4' x 3'	Showy mallow flowers in pinks & purples
Lonicera hispidula	California honeysuckle	D	3' x 6'	Native honeysuckle vine
Lupinus species	Lupines	D	2' x 3'	Native lupines, flower colors from yellow to purple
Mimulus (Diplacus) aurantiacus	Monkey flower	E	1' x 1'	Showy summer apricot yellow flowers
Monardella villosa 'obispoensis'	San Luis Obispo monardella	E	0.6'x0.5'	Wild mint with lavender bon-bon flower heads
Muhlenbergia rigens	Deer grass	E	2' x 2.5'	Grey green leaves with straw color seed stalks
Nassella lepida	Needle grass	D	1' x 0.5'	Bunch grass with airy spikes of seed stalks
Nassella pulchra	Purple needle grass	D	2' x 2'	Bunch grass with airy spikes of seed stalks
Penstemon 'Margarita BOP'	Margarita penstemon	E	0.7'x1'	Showy purple flower stalks all summer
Rhamnus californica	Coffeeberry	E	4' x 5'	Excellent drought foliage shrub
Rhus integrifolia	Lemonade berry	E	3.5' x 5'	White /pink spring flowers on foliage shrub

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Seashell Estates, Morro Bay, California
August 20, 2007

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Botanical Name	Common Name	Evergrn Decid.	Size HxW	Comments
Ribes speciosum	Fuchsia flowering gooseberry	D	2' x 2'	Showy spring pink flowers followed by read berries
Romneya coulteri	Matilija poppy	D	3' x 3'	Bold 6" white summer flowers with yellow center
Salvia species	Wild sages	D	1.5'x2'	Many species with showy white, blue or purple flowers
Sisyrinchium californicum	Golden eyed grass	D	0.8x0.8	Small iris like plant with yellow or blue flowers
Vaccinium ovatum	Hunckleberry	D	2' x 2'	Edible berries following white spring flowers
Vitis californica	California grape	D	3' x 8'	Native grape vine
Zauschneria californica	California fuchsia	Semi-E	0.5x1.0	Showy tubular flowers attract hummingbirds
PLANTS FOR TRANSITION ZONE REVEGETATION (Adapted to serpentine soils, some may be difficult to find in nurseries.)				
TREES, SHRUBS, FORBS (non-grass herbs)				
Arctostaphylos pechoensis	Pecho manzanita	E	1' x 1.5'	Low growing, adapted to serpentine soil
Astralgalus nuttallii	Nuttal's milk vetch	perenn		Indigenous to Morro Bay serpentine areas
Calestegia subacaulis 'espiscopolis'	Cambria morning glory	perenn		Indigenous to Morro Bay serpentine areas
Calochortus obispoensis	San Louis Obispo mariposa lily	bulb		Indigenous to San Louis Obispo County
Castilleja densiflora ssp. Obispoensis	Obispo India paint brush	annual		Native wildflower, magenta flower heads
Chorogalum pomeridianum va. Minus	Dwarf soaproot	annual		Yellow flowers on gray fine leaves
Chorizanthe breweri	Brewer's spineflower	annual		Native wildflower, small white flowers in clusters
Corethrogyne (Lessingia) filaginifolia	California aster	annual		Native wildflower, small daisy like white to pink
Dudleya abramsii ssp. Bettineae	S.L. Obispo serpentine dudlya	E	0.5 x .05	Succulent, gray foliage
Eschscholzia californica	California poppy	annual		Bright orange poppies with fine texture grey leaves
Gilia capitata	Globe gilia			Native wildflower, flowers like bachelor's button
Hazardia squarrosa	Golden bush			Yellow flowers on green leaves
Heteromeles arbutifulia	Toyon	E	8' x 6'	Red berry clusters in late fall & winter

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Botanical Name	Common Name	Evergrn Decid.	Size HxW	Comments
Isocoma menziesii	Golden bush			Profuse small yellow flowers, brigh green leaves
Lupinus species	Lupines	Various	varies	Many species with mostly blue flowers
Mimulus guttatus	Seep monkey flower	E	1.5'x1.5'	Apricot yellow flowers
Monardella palmeri	Palmer's monardella	annual		Native wildflower, lavender color flowers
Pinus sabiana	Digger pine	E	25' x 18'	Gray green needles, airy structure
Plantago erecta	Plantain	perenn	0.3'x0.5'	Blade leaves with flower heads on stems
Sanicula maritima	Adobe senicle	perenn	0.5'x0.5'	Yellow green leaves, yellow flowers
NATIVE GRASSES				
Bromus laevipes	Chinook brome	annual		
Leymus elymoides	Wild rye	perenn		
Leymus multisetus	Wild rye	perenn		
Nassella lepida	Needle grass	semi-ev		Bunch grass, graceful seed stems
Nassella pulchra	Purple needle grass	semi-ev		Bunch grass, tall graceful seed stems
Vulpia microstachys	Six weeks grass	annual		

Appendix 3: San Luis Obispo Green Build Brochure

Green Building

For San Luis Obispo County

SLO County Supplement

This supplement describes general conditions in San Luis Obispo County and is for informational purposes only. Actual building performance will depend on specific conditions regarding site, building construction, and use, which are the responsibilities of the specific designer and builder.

Climatic Variations in SLO County

Valley Zone

More extreme than the other zones due to higher elevations, clear skies, and dry air. Hard freezes occur in winter, and summers are characterized by high temperatures on a regular basis.

Coastal Zone

Moderated climate requiring very little cooling and only moderate amounts of heating, if you have a good passive building. Heating, however, can be needed over longer periods than other zones due to summer fog.

Inland Zone

Seasons are more distinct than the coastal zone, hotter in summer and colder in winter. Temperatures can fall to the teens in winter, but reach the 100's in summer. Hard freezes and even snow may occur in the higher elevations.

Relative Daily Temperature Variation

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Passive Heating & Cooling in San Luis Obispo County

SLO Green Build

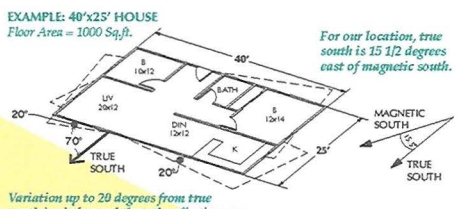
RULES OF THUMB

What is a passive building?

A passive building is one that is tuned with regard to orientation, glazing and thermal mass so that it heats and cools itself with a minimum amount of back-up energy.

1 Orient Building To South

The building is oriented to true south plus or minus 20 degrees or less. The most important rooms have some south-facing glazing, either through south walls or roof openings, like south-facing skylights or dormers.

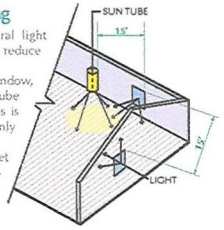


1a. Employ Natural Lighting

All major rooms should have natural light from at least 2 different directions to reduce glare.

All major rooms must have a window, skylight, or roof mounted light tube within at least 15' of each other. This is because the reach of natural light is only about 12' into a room.

Roof light tubes are a good way to get good natural light without introducing a lot of heat into the room.

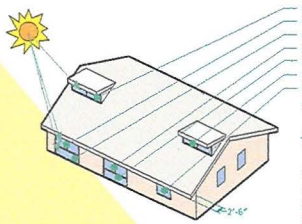


2 Provide Adequate South Glazing

Optimally, south glass area should be 12 to 20 percent of the floor area. This south glass should be shaded by approximately a 2'-6" horizontal overhang to allow summer shading when the sun is high, while allowing low winter sun into the building.

The idea that the more south glass the better is not true. You can over glaze on the south for SLO County climates and actually hurt building performance.

For this reason, any glazing strategy must be carefully considered.

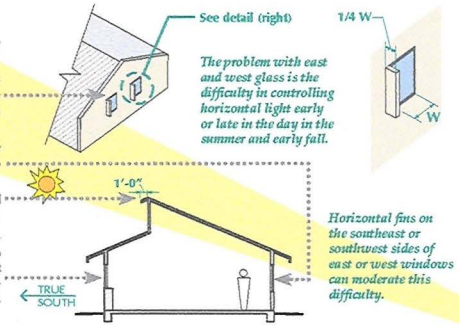


For this example, southern glazing is ok, because it is between 12% and 20% of the floor area.

2a. Optimize Solar Control

Solar control is used to prevent unwanted solar heating in the summer and early fall. The following strategies accomplish this:

- East and west glass should be less than 5 percent of the floor area unless shaded by a vertical fin with a depth of 1/4 the width of the window it shades.
- North glass should be used sparingly unless you use low-e double-pane glass to reduce heat loss.
- South glass less than 4 feet in height should be shaded with a 1-foot horizontal overhang.
- Do not use the standard low-e, heat rejecting glass on the south if you want to solar heat. Instead, use low-e, hard-coat glass (U > .33; solar heat gain coefficient > .65) or, if unavailable, use double-glazed, clear glass on the south.



The problem with east and west glass is the difficulty in controlling horizontal light early or late in the day in the summer and early fall.

Horizontal fins on the southeast or southwest sides of east or west windows can moderate this difficulty.

3 Provide Sufficient Thermal Mass

Thermal mass prevents overheating during the day and overcooling at night. Provide 8 to 12 sq.ft. of any combination of the following thermal mass options (A through E in the diagram to the right) for each square foot of south-facing glass.

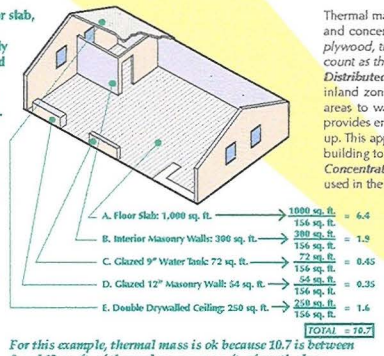
A. Exposed concrete floor slab, such as plain or colored concrete, tile, or a directly applied thin layer of wood or bamboo (parquet).

B. Interior masonry wall 2 inches or more in thickness and well insulated from the exterior.

C. 9-inch deep steel water tank exposed directly to the south and double-glazed. Count as area multiplied by 4.

D. 12-inch thick masonry wall exposed directly to the south and double-glazed. Count as area multiplied by 3.

E. Double 5/8-inch drywall. Count as area multiplied by 0.25.



For this example, thermal mass is ok because 10.7 is between 8 and 12 sq. ft. of thermal mass per sq. ft. of south glass.

Thermal mass falls into two categories: distributed mass, which includes A and B; and concentrated mass, which includes either C or D. *Note that wood framing, plywood, thin tile, and other common building materials are not heavy enough to count as thermal mass.*

Distributed mass works well for heating and cooling. It is especially good for the inland zone of our county, because the distributed mass provides large surface areas to wash with cool night air when the building is ventilated at night. This provides enough cooling to override the next hot day, when the building is closed up. This approach to passive cooling usually allows the interior temperature of the building to be about 20 degrees Fahrenheit below the daytime temperature.

Concentrated mass, while less effective for cooling, is ideal for heating and thus best used in the coastal zones or, mixed with distributed mass, in the other two zones.

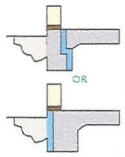
3a. Provide Good Insulation

Insulation is the least expensive component of building construction and is critical to a good performing passive solar building.

If the floor slab is to be used for thermal mass, it is very important to insulate its perimeter with 1 1/2 inch closed-cell styrofoam insulation to the bottom of the footing.

For the inland and valley zones, it is best to use at least R-30 insulation in exterior walls and R-45 insulation in the ceiling or roof cavity.

The coastal zone requires less insulation. A good rule here is R-21 in the walls, and R-30 in the ceiling or roof cavity.



Two ways to prevent heat loss out the edge of the slab.

The reason straw bale construction is so popular in green buildings in San Luis Obispo County is that this construction type gives a R-33 wall and provides good thermal mass with the 1 1/2" to 2" interior stucco finish.

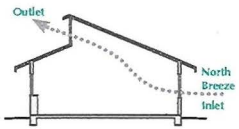
3b. Maximize Natural Ventilation

Passive cooling in our climates is easy to achieve by venting the thermal mass at night by natural ventilation and then closing up the building during the day to ride out the hot daytime period.

All major rooms should have the ability to be cross-ventilated with at least 4 sq. ft. of opening on each side of a 100 sq.ft. room. (Double for screened openings, since screens reduce air flow.)

Check your dominant summer and fall breeze directions to aid in placing these openings. Most breezes in San Luis Obispo County come from the northwest, except during winter rainstorms.

Ventilation can be enhanced if the inlet opening is lower than the outlet opening.



How can you be Green?

Use the Green Building Rating system described on pages 20 & 21 of the *Green Building Guidelines* to assess your project. In addition to the points listed in the guidelines, points are also awarded in San Luis Obispo County for your following green building efforts:

Infill Development ..... *15 points*
Exterior Wall Straw Bale Construction ..... *5 points*
Interior Cob or Rammed Earth ..... *5 points*
Passive Design using the Rules of Thumb ..... *20 points*
Natural Daylighting for 90% of Spaces ..... *10 points*

To apply these points to the checklist, enter the items under Section N.3—Other/Local Priorities.

How Green can you be?

Your point totals under the Green Building Rating System determine which level your project will reach.

Basic Green ..... *50 points*
Jade ..... *75 points*
Emerald ..... *100 points*
Ultra Green ..... *150 points*

About SLO Green Build

SLO Green Build is a nonprofit group of area architects, builders, community planners, realtors, and residents devoted to helping local governments, building professionals, and home owners design, construct, and remodel homes and facilities using sustainable building practices and materials.

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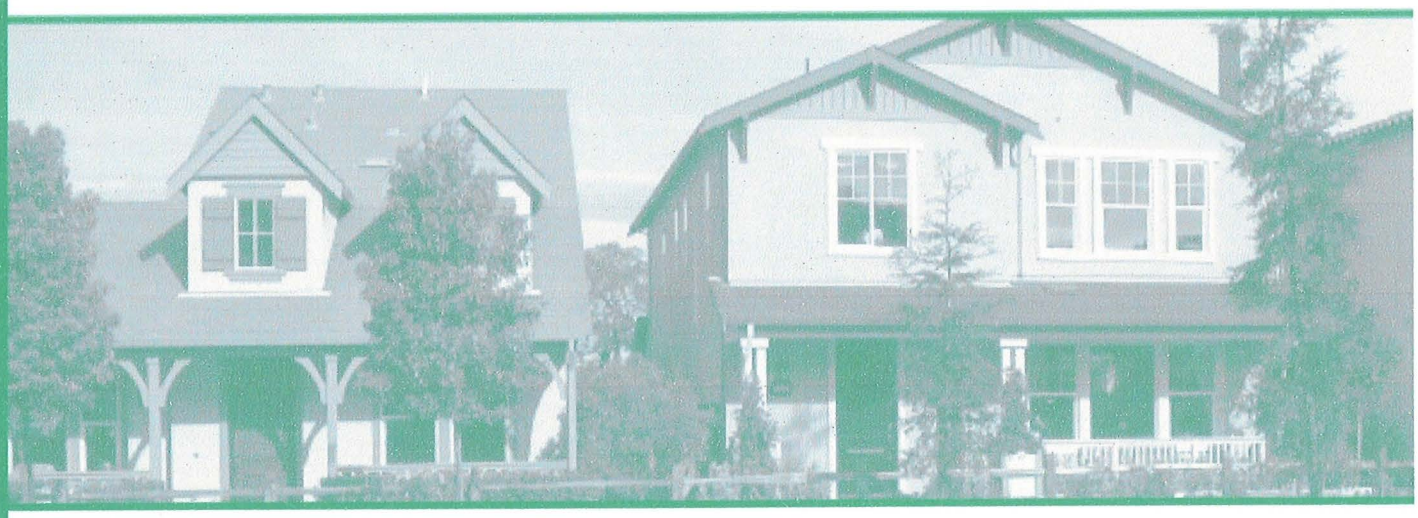
Please visit our Web site at:
www.slogreenbuild.org

Appendix 4: Green Building Manuel, Guidelines & Checklist

GreenPointRATED
A PROGRAM OF BUILD IT GREEN

GreenPoint Rated Single Family
RATING MANUAL

Version 4.1 April 2010



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Smart Solutions from the Ground Up

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A. SITE

1. PROTECT TOPSOIL AND MINIMIZE DISRUPTION OF EXISTING PLANTS & TREES

INTENT

Preserve the existing and healthy topsoil, landscape and vegetation. Reduce the effort and resources needed to rebuild soils and landscape. Reduce water runoff.

DESCRIPTION

Soil is a valuable, living resource that should be protected. Through careful planning and construction practices, valuable soil as well as mature trees and other plants can be preserved and incorporated into new landscapes and neighborhoods. Preservation of topsoil and vegetation can reduce stormwater during and after construction.

CRITERIA FOR QUALIFICATION

a. Protect Topsoil and Reuse after Construction (2 Points)

A project must meet minimum local regulations for erosion control and avoid silt entering drainage systems by using effective erosion control practices, and then go obviously and measurably beyond those practices. This is implemented by taking actions to prevent the deliberate destruction and removal of horticulturally suitable topsoil by grading, and instead, protecting and using this valuable topsoil.

Horticulturally suitable topsoil is defined as high quality, "living" soil that contains an active biology of compost and natural microorganisms that provide a nutrient rich environment for healthy plant growth. Specifically, quality topsoil is considered to have organic matter content between 3.5% -10%, soluble salts less than 0.5 mmhos/cm, and be free of large roots, clods, stones larger than 1", noxious weeds, sticks, lumber, brush and litter, and infestations of undesirable disease-causing organisms such as insects and plant pathogens. A good reference manual is "Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13" (http://compostwashington.org/PDF/SOIL_MANUAL.pdf).

If the project's existing soil does not meet the criteria of "horticulturally suitable," then this measure is not applicable.

Such action for protecting valuable topsoil before grading includes implementing the following non-exhaustive list of practices:

a. Evaluating the topsoil before grading to determine its suitability for horticultural purposes

b. Removing greater than 6 inches of horticulturally suitable topsoil before grading (especially from areas to be covered by an impervious surface) and storing in protected areas on site

c. Clearly delineating areas for storing topsoil on plans

d. Stockpiling removed topsoil in piles no larger than 6 feet high to avoid compacting the pile and depleting oxygen levels and killing the active soil biology

e. Protecting stored topsoil from erosion during storage by installing organic compost filter berms and socks, hydro-seeding, covering with mulch or plastic, etc. (topsoil in ungraded areas may be protected in place using similar methods)

f. Aerating compacted subsoil in turf and planting areas

g. Respreading stored topsoil on site or reusing for stabilizing disturbed soils, creating swales and planted buffers and other features that improve site conditions.

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Note: This measure is intended for managing horticulturally suitable topsoil that already exists on the lot. If the project wishes to upgrade its soil by importing horticulturally suitable topsoil and/or soil amendments, then measure C.7 is the appropriate measure to implement.

b. Limit and Delineate Construction Footprint for Maximum Protection (1 Point)

This credit is given to projects that obviously and significantly exceed minimum ordinance requirements for protecting trees and plants. A typical basic requirement of a jurisdiction is to fence trees at the drip line or other such requirements for minimum landscape protection. Incorporate at least three of the following other deliberate actions to achieve greater landscape protection:

a. Develop and effectively implement during construction a tree / plant preservation plan with no-disturbance zones clearly delineated on project drawings. Zones must go significantly beyond the tree drip lines or limited landscape beds

b. Preparation of plants through best practices in pruning of limbs and roots, watering, fertilizing, etc. for protection from construction activities

c. Reduce soil compaction from construction equipment by laying thick (greater than 6 inches) beds of local mulch, chipped wood, etc.

d. Leave undisturbed at least 40% of previously undeveloped lot area

e. Create contract language for the subcontractors to follow regarding reducing/minimizing site disturbance. Establish contractual penalties for destruction of trees and disturbance of site areas noted for protection. Train workers on implementing these practices

f. Delineate laydown, recycling, and disposal areas. Use areas to be paved as staging areas. Delineate parking for cars, trucks and equipment on plans.

VERIFICATION

Accountability Form signed by Landscape Architect and/or Builder or other appropriate expert for meeting the measure requirements. Soil protection plan, landscape plan, project manual, contract documents, subcontractor scopes of work, or specifications book may offer documentation for these measures. Rater shall conduct field observations to ensure implementation of the appropriate measures.

CODE ISSUES

Stormwater management is subject to federal, state and local requirements. Projects impacting 10,000 square feet or more are required to submit a National Pollutant Discharge Elimination System Discharge (NPDES) permit under the federal Clean Water Act. California requires a Stormwater Pollution Prevention Plan (SWPP) permit for projects that disturb more than one acre. Topsoil protection will encourage compliance with these regulations.

ADDITIONAL RESOURCES

- The Bay Friendly, River Friendly and California Friendly Landscaping Guidelines give thorough information and landscape design strategies to conserve topsoil and minimize construction footprint: www.bayfriendly.org, www.riverfriendly.org, www.bewaterwise.com
- The California Stormwater Quality Association has brochures, fact sheets and other information on how to control stormwater during construction: www.casqa.org
- University of Massachusetts Building Materials and Wood Technology department's article, 'Preserving Trees During Construction' has detailed information about planning for tree preservation: bct.nrc.umass.edu/index.php/publications/by-title/preserving-trees-during-construction/
- Washington State Department of Ecology's publication "Restoring Soil Health to Urbanized Lands" and the Washington Organic Recycling Council's publication "Guidelines and Resources for Implementing Soil Quality and Depth BMP 15.13"

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describe best management practices for soil quality, stormwater retention and water quality: www.deq.state.or.us/lq/pubs/docs/sw/compost/RestoringSoilHealth.pdf and www.buildingsoil.org/tools/Soil_BMP_Manual.pdf

2. DIVERT/RECYCLE JOB SITE CONSTRUCTION WASTE (INCLUDING GREEN WASTE AND EXISTING STRUCTURES)

INTENT

Promote recycling efforts and reduce pressure on landfills and the need to harvest new resources. Encourage recycling of asphalt and concrete in particular, since there is a high demand for recycled aggregate in the construction industry.

DESCRIPTION

Each year close to nine million tons of construction and demolition (C&D) debris is disposed of in California landfills. This represents 22% of the statewide waste stream, but in newer communities C&D waste sent to landfills can be as high as 50%. Construction waste generally consists of wood, drywall, metal, concrete, and cardboard. It can also include plant debris (green waste) from the landscape. Much of this material can be reused or recycled.

CRITERIA FOR QUALIFICATION (up to 4 Points)

Identify the types of materials to be generated on site and location of disposal or reuse of each material using the Pre Construction Debris Recovery Plan or equivalent document. Identify the types and quantities of materials generated at the job site and reuse or recycle at least 50% of the non-hazardous construction debris, including green waste and deconstructed structures by weight. Optional practices to meet this requirement include:

- Allocate space for recycling bins and containers on the job site and train workers.
- Establish and use a cut-pile to reduce waste from scrap pieces of wood, drywall, roofing and siding.
- Separate green waste from other materials.

The following percentage thresholds include green waste and the deconstruction of existing buildings and calculations are done by weight:

a. Divert 50% (by weight) of all Construction and Demolition Waste (Required) (Recycling and Reuse)

b. Divert 100% of Asphalt and Concrete and 65% (by weight) of Remaining Materials (Recycling or Reuse) (2 Points)

c. Divert 100% of Asphalt and Concrete and 80% (by weight) of Remaining Materials (Recycling or Reuse) (4 Points Total)

VERIFICATION

The builder will submit the Pre Construction Debris Recovery Plan in the planning stages of construction to the Rater. The Rater will submit this form to Build It Green with the project application. Builder will submit Post Construction Debris Recovery Statement and documentation of results (i.e. hauler load tags, builder's waste tabulation supplied by local waste authority and/or recycling rates for the local facility from local waste authority). Rater has the option of conducting field observations to get a sense waste diversion practices. However, field observation can not be used as a judgment or verification method of the documented results as some builders have waste separated and recycled off site and it is not evident on site. To facilitate this process occurring smoothly, plans should be submitted with

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the Build It Green Sample Debris Recovery Statement or equivalent form required by local jurisdictions or regularly used by the Builder.

CODE ISSUES

Assembly Bill 939 requires towns and cities to reduce the amount of waste sent to landfills by 50 percent . Projects in many California counties are required to divert up to a minimum of 50% of construction waste from landfills (by weight) through recycling or reuse. Some jurisdictions have more stringent requirements. Find out the local recycling requirements and hauling restrictions prior to initiating a project.

ADDITIONAL RESOURCES

- The California Integrated Waste Management Board (CIWMB) provides information about C&D management and maintains a statewide database of C&D recyclers, searchable by material type and location: www.calrecycle.ca.gov/ConDemo/
- Contact the California Integrated Waste Management Board at www.ciwmb.ca.gov for more information on recycling facilities. For conversion tables for materials see www.ciwmb.ca.gov/LgLibrary/DSG/Apndxl.htm#Conversion.
- The U.S. Environmental Protection Agency publishes the Waste Reduction Model (WARM), an online tool to estimate the greenhouse gas emissions savings of recycling different types of C&D materials: www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.htm

3. USE RECYCLED CONTENT AGGREGATE (MINIMUM 25%)

INTENT

Promote recycling efforts and reduce pressure on landfills and the need to mine new resources.

DESCRIPTION

Virgin aggregate comes from sources such as riverbeds and quarries where mining activities may disturb the environment. Recycled aggregate consists mainly of crushed concrete and crushed asphalt pavement. Recycled concrete and asphalt crushed to ¾-inch meets the California Department of Transportation's (CalTrans) specification for Class 2 Aggregate Base.

CRITERIA FOR QUALIFICATION (up to 2 Points)

Use aggregate with a minimum of 25% recycled aggregate by volume for:

a. Walkway and Driveway Base (1 Point)

b. Roadway Base (1 Point)

Pre consumer recycled content is equal to half the value of post consumer recycled content.

VERIFICATION

Rater may conduct field compliance verification to see crushed concrete aggregate in sitework and will verify documentation showing compliance with this measure. This should include a calculation of the recycled aggregate percent based on vendor invoice.

CODE ISSUES

California and local codes will dictate specifications. Many jurisdictions in Northern California use the Department of Transportation's specifications for Class 2 Aggregate Base, and in

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Southern California, the base specifications in *Standard Specifications for Public Works Construction* are commonly used.

ADDITIONAL RESOURCES

- The California Integrated Waste Management Board (CIWMB) provides extensive information on specifying aggregate for base, including recommendations for Northern California (Caltrans) and Southern California (Greenbook): www.ciwmb.ca.gov/ConDemo/Aggregate
- The "Greenbook" (Standard Specifications for Public Works Construction) can be purchased from www.bnibooks.com

4. COOL SITE: REDUCE HEAT ISLAND EFFECT ON SITE

INTENT

Reduce the impact of residual heat build-up in developed areas (urban heat-island effect). Reduce air conditioning loads, save energy and minimize the chemical reaction that produces ground-level smog.

DESCRIPTION

Cool site measures are most important in urban environments where large areas of asphalt and buildings retain heat and increase temperatures in the surrounding environment. Pervious concrete/paving (poured or tile) that are at least 50% pervious, open-grid paving systems, granite or crushed rock for walkways, driveways and paths, and resin-modified emulsion pavement are examples of materials that may meet the cool site requirement.

CRITERIA FOR QUALIFICATION (1 Point)

For at least 50% of the site's impervious area (e.g. walkways, driveways, plazas and parking areas), excluding the building footprint, incorporate light-colored paving materials or pavers with a solar reflectance greater than 0.3 or Solar Reflectance Index greater than 29% (color equivalent of uncolored concrete with or without any proportion of fly ash and/or slag)

OR

Design and install overhangs, shading elements, trees and shrubs (or preserve existing trees and shrubs) to shade at least 50% of sidewalks, patios, and driveways within 50 feet of house (based on noon on June 21 at 15 years' growth).

OR

Include covered parking (underground or under overhangs/awnings) (exposed podium patio or roof must meet the criteria of solar reflectance greater than 0.3 or Solar Reflectance Index greater than 29%)

Definitions:

Solar reflectance is a measure of the ability of a surface material to reflect sunlight – including the visible, infrared, and ultraviolet wavelengths – on a scale of 0 to 1. Solar reflectance is also called "albedo." Solar Reflectance is measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549.

Emittance of a material refers to its ability to release absorbed heat. Scientists use a number between 0 and 1, or 0% and 100%, to express emittance. With the exception of metals, most construction materials have emittance above 0.85 (85%). Emittance is measured according to ASTM E 408 or ASTM E 903.

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Solar Reflectance Index (SRI) is a value that incorporates both solar reflectance and emittance in a single value to represent a material's temperature in the sun. SRI quantifies how hot a surface would get relative to standard black and standard white surfaces. It is expressed as a fraction (0.0 to 1.0) or percentage (0% to 100%). SRI is calculated using equations based on previously measured values of solar reflectance and emittance as laid out in ASTM E 1980.

VERIFICATION

Builder, Developer or Architect will submit documentation of material, shading (if appropriate) and coverage. Rater will conduct field compliance verification. Rater may require Accountability Form from Builder, Developer or Architect stating compliance with this measure.

CODE ISSUES

Follow all applicable local codes, ordinances and community covenants. Local jurisdictions may or may not offer credit on stormwater control requirements due the use of some of these measures.

ADDITIONAL RESOURCES

- The American Concrete Pavement Association offers technical resources about concrete pavement practices www.pavement.com
- The Collaborative for High Performance Schools (CHPS) Best Practices Manual volume II – Design has details about cool sites: www.chps.net
- The Interlocking Pavement Institute has technical information on designing, specifying and installing permeable pavers: www.icpi.org
- The Lawrence Berkeley National Laboratory's (LBNL) Heat Island Group has information about strategies to reduce the heat island effect: http://eetd.lbl.gov/HeatIsland

5. CONSTRUCTION ENVIRONMENTAL QUALITY MANAGEMENT PLAN, DUCT SEALING, AND PRE-OCCUPANCY FLUSH-OUT

INTENT

Reduce environmental quality risks for construction workers in the short term and building occupants in the long term. Minimize construction-related contamination.

DESCRIPTION

Protect environmental quality during construction by implementing dust control strategies, protecting construction materials from water damage, flushing out the building before occupancy and allowing materials to offgas before proceeding with final installation of interior finishes.

CRITERIA FOR QUALIFICATION (2 Points)

Include in the project specifications a Construction Environmental Quality Management Plan that requires the following:

a. Protect construction materials from water damage during construction

b. Cap ducts during construction

c. Clean duct boots before end of construction

d. For rehabilitation projects, implement a dust control plan that prevents particulates from migrating into occupied areas

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2009 Edition

NEW HOME CONSTRUCTION

GREEN BUILDING GUIDELINES

Build It GREEN

Smart Solutions from the Ground Up

2009 Edition

NEW HOME CONSTRUCTION

GREEN BUILDING GUIDELINES

Green Building in Alameda County

Debris from construction, demolition and landscape projects comprises nearly 11% of the materials disposed in Alameda County landfills. To reduce this waste, Green Building in Alameda County has formed a public/private partnership with the construction and building industries. The program serves three target markets: cities and public agencies in Alameda County; design and building industry professionals; and residents of Alameda County.

The key components of Green Building in Alameda County are:

- Guidelines
- Technical Assistance and Grants
- Education
- Partnerships
- Policy Development
- Case Studies

Green Building in Alameda County endorses the use of:

- **Build It Green's GreenPoint Rated Program and Green Building Guidelines for New Home Construction, Home Remodeling and Multifamily.** This publication is the 2009 edition of the New Home Construction Green Building Guidelines. For guidelines for Home Remodeling and Multifamily, the Builders' Guide to Reuse and Recycling, and other resources, visit www.BuildGreenNow.org.
- **Bay-Friendly Landscape Guidelines and Bay-Friendly Gardening Guide.** Builders in Alameda County are encouraged to meet all the Bay-Friendly Landscaping prerequisites and incorporate additional practices to meet the minimum score required for a Bay-Friendly Landscape. Refer to the Bay-Friendly Landscape Plan Review and Scorecard at www.BayFriendly.org.
- **U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Green Building Rating System** for commercial and civic buildings. To learn more, visit www.usgbc.org.

GREEN BUILDING
in Alameda County
www.SaveGreenNow.org

Bay-Friendly Landscaping

Bay-Friendly Landscaping is a whole systems approach to the design, construction and maintenance of the landscape in order to support the integrity of one of California's most magnificent ecosystems, the San Francisco Bay watershed.

A well-designed and maintained Bay-Friendly Landscape can cost less to maintain in the long run by consuming fewer resources. Bay-Friendly Landscapes embody community values for health, wildlife and the environment, while providing benefits to the homeowners, such as lower water or garbage bills.

BAY-FRIENDLY
LANDSCAPING

StopWaste.Org Disclaimer

Green Building in Alameda County and Bay-Friendly Landscaping are programs of StopWaste.Org, which is the Alameda County Waste Management Authority and the Alameda County Source Reduction and Recycling Board operating as one public agency. The information provided in these Guidelines should be considered by contractors, architects and other professionals, as well as owners, in the course of designing and constructing new or modified structures. These Guidelines are provided as a public service by Green Building in Alameda County, in conjunction with Build It Green, in an attempt to provide environmental benefits to the public. The Guidelines are not a substitute for the exercise of sound judgment in particular circumstances and are not intended as recommendations for particular products or processes. The Guidelines are also subject to Build It Green's disclaimer on the following page.

About Build It Green

Build It Green is a professional non-profit membership organization whose mission is to promote healthy, durable, energy- and resource-efficient buildings in California. Supported by a solid foundation of outreach and education, Build It Green connects consumers and building professionals with the tools and technical expertise they need to build quality green homes. Among these tools is GreenPoint Rated, which is an objective, third-party residential green building verification system that offers an array of benefits for different stakeholders. Build It Green fosters collaboration with key stakeholder groups to accelerate the adoption of green building standards, policies, and programs.

In addition to providing these Guidelines for educational purposes, Build It Green offers the following companion resources at www.BuildItGreen.org:

- GreenPoint Rated checklists and manuals
- Innovation checklist for approaches beyond the measures described in the Guidelines
- Professional training to become a Certified Green Building Professional and/or Certified GreenPoint Rater
- Green Product Directory
- Information about new practices and materials or corrections that are identified after publication

Build It GREEN™

Smart Solutions from the Ground Up

- Cross-referencing use of GreenPoint Rated and the Guidelines by local governments
- Cross-referencing with other residential initiatives (e.g., Energy Star Indoor airPLUS Program, LEED-H, CA Green Builder and the NAHB Guidelines)

For more information about Build It Green contact: admin@BuildItGreen.org or call 510.845.0472.

Disclaimer

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Design: Celery Design Collaborative, Berkeley, CA

Printing: 100% post-consumer recycled paper using soy-based inks

Foreword

These New Home Construction Green Building Guidelines were developed to:

- provide local governments with an educational tool for city staff, builders and homeowners interested in green residential construction;
- present a range of voluntary practices for builders to choose from when constructing a green home in California;
- create a policy foundation for local governments interested in implementing green building programs and ordinances;
- establish regional consistency in green building guidelines to increase predictability for builders;
- integrate varying residential initiatives in order to achieve greater simplicity and local applicability; and
- offer a set of guidelines developed by an independent, third-party source.

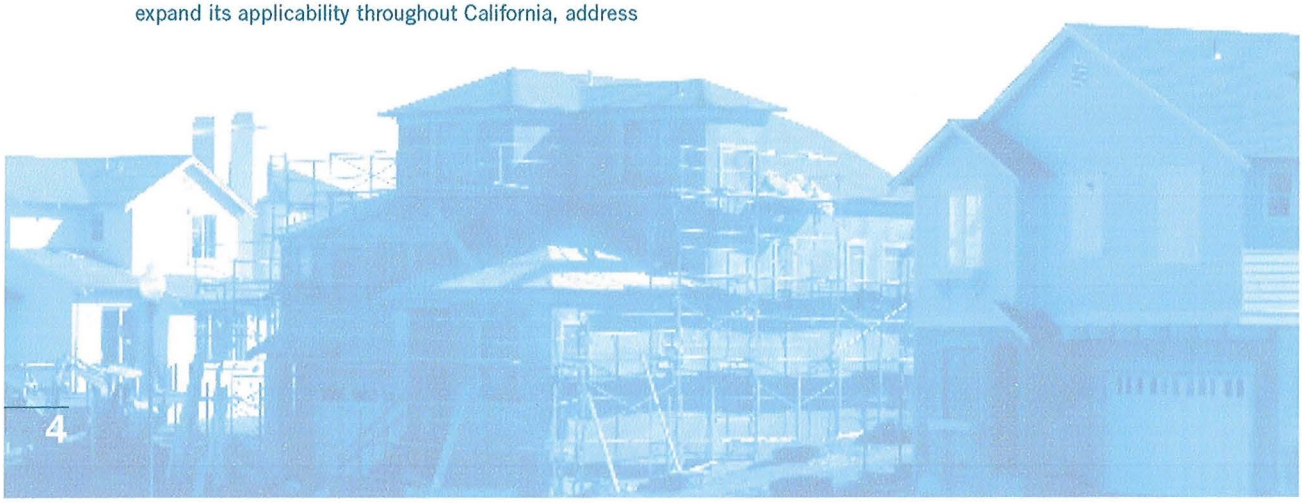
Guidelines Development Process

Over the years, the New Home Construction Green Building Guidelines have been developed and updated through a collaborative process. They are based on Guidelines first developed in 2000 through a public-private partnership among builders, green building experts, and local government staff in Alameda County. Representatives from major production builders, including Centex Homes, Greenbriar Homes, Ponderosa Homes, Pulte Homes, Shea Homes, Signature Properties, Silverwood Homes, and Toll Brothers, provided input and direction in the development of the original Guidelines.

The Guidelines were updated in 2005 and 2007 to expand its applicability throughout California, address changes in California's Building Energy Efficiency Standards (Title 24), and incorporate measures from other residential green building initiatives such as the California Green Builder program, National Association of Home Builders guidelines, and the pilot draft LEED for Homes checklist. In 2009, the Guidelines were revised to reflect the 2008 update to Title 24, as well as to incorporate more advanced green building practices.

Build It Green expanded the update process in 2009 to include participants from all sectors of residential building including builders, real estate professionals and product suppliers. Representatives from local jurisdictions and Build It Green's councils, including the Public Agency Council, Builders Council and Rater Council, provided input, and utility representatives provided technical expertise. The update process included outreach to many State of California agencies, including Integrated Waste Management Board, Public Utilities Commission, Energy Commission, Office of Environmental Health Hazard Assessment, Department of Water Resources, Environmental Protection Agency and Air Resources Board.

Publicly available information, scientific data, and third-party standards were referenced in the development of these Guidelines. The Guidelines are intended to be a living document, and will be regularly updated as additional technical and quantitative information becomes available, measurement tools such as Life Cycle Assessment become more accessible, and new green measures are developed.



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These Guidelines were produced through collaboration between Green Building in Alameda County and Build It Green. Special thanks to the following individuals and organizations for contributing to the 2009 edition of these Guidelines.

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Chapter One
Overview of Green Building

"We have made a strong commitment to building homes that are green and increasingly sustainable. As part of this commitment we have participated in Build It Green's rating program since 2006 to help measure our success and to further shape and improve our green practices."

–Katia Kamangar, SummerHill Homes

Overarching Principles Of Green Building

1. **Build for the long-term.**
   Build durable homes & livable communities.
2. **Build for our children.**
   Make their homes, communities & environment safe.
3. **Build for the planet.**
   Use natural resources wisely.

Introduction

Green building is gaining momentum in California, and for good reason. This holistic approach to homebuilding emphasizes quality construction, reduced greenhouse gas emissions, energy and water efficiency, less waste, good indoor air quality and livable neighborhoods.

In California alone, an estimated 2.6 million new homes will be built by 2020, according to California Energy Commission forecasts. Imagine the demands that all those homes will put on our water and energy supplies, forests, farmlands, recreational areas, roadways and municipal infrastructure.

Green building offers solutions to meeting those demands while minimizing environmental impacts. By building durable, healthy homes that consume less energy, water and other resources, today's green homebuilders are helping safeguard the well-being and prosperity of Californians today and for decades to come.

Buildings and climate change

Although all sectors of the economy affect the environment, the building sector's impacts are particularly large. Buildings, it turns out, account for nearly half of all greenhouse gas emissions annually in the United States. Green buildings help rein in these emissions because they use less fossil fuel–based energy for heating and cooling, water heating, lights and appliances.

Using energy to keep lights on and air conditioners humming isn't the only way that buildings contribute to global warming. Water use is also intimately tied to the production of greenhouse gases, a result of the tremendous amount of energy used to treat and distribute water. Efforts to reduce residential water use not only conserve a resource that's in increasingly short supply, they also help reduce greenhouse gas emissions associated with water distribution.

Waste reduction and recycling, two fundamental green building strategies, can also have a profound effect on climate stabilization. Consider green waste, for example, especially the landscaping waste that's created when a new home site is prepared for construction. Preserving existing vegetation on the site instead of sending it to the dump reduces the amount of methane produced when organic materials decompose in landfills. That's important because methane is twenty-one times more potent as a greenhouse gas than carbon dioxide. Recycling and buying recycled-content products also protect the climate because making products from recycled materials typically uses less energy than making goods from virgin resources.

Land use decisions also play a critical role in climate stabilization. Better community planning—including the compact, transit-oriented, mixed-use developments encouraged by green building—has significant potential to reduce the miles that residents drive.

For these and many other reasons, policymakers, building professionals and residents across the state are embracing green building as one of the principal means of reducing greenhouse gas emissions that contribute to climate change.

Fundamental Objectives of Green Building

There's nothing mysterious about green building—it's really just applied common sense. To move forward with greening your construction project, it is helpful to think of green building as quality design and construction achieved through the convergence of four fundamental objectives:

1. Conserve natural resources
2. Use energy wisely
3. Improve indoor air quality
4. Plan for livable communities

Conserve natural resources

Conventional building construction and operation consume large quantities of wood, water, metals, fossil fuels and other natural resources. Even though the majority of the materials used to build a home are put to good use, vast quantities of resources are wasted. In fact, building an average 2,000-sq. ft. house produces about 8.5 tons of construction and demolition waste.

Much of this waste is avoidable. Careful management of the construction process makes a big difference. There are also many well-established homebuilding practices that help protect natural resources. For example, advanced framing techniques can substantially reduce lumber requirements without compromising structural integrity. Using engineered lumber and wood products certified by the Forest Stewardship Council can help protect old-growth forests.

There are many effective building strategies that conserve natural resources, as well as provide benefits such as cost savings. These include using durable products such as roofing materials with 40- or 50-year warranties, and specifying recycled-content or reclaimed products that divert waste from landfills. Recycled-content decking, reclaimed lumber and other products put waste to good use, while providing quality and durability that often exceed conventional materials. For example, decking materials made of recycled plastic mixed with wood waste fibers can last up to five times longer than wood decking, and never need to be treated or painted.

Water is another critical resource. California residences use 5.6 million acre-feet of applied water annually. Our prosperity and ability to meet the needs of our growing population hinge on having adequate supplies of clean, fresh water. Homes built and landscaped to use water wisely make a tremendous contribution to protecting our shared resources. An added benefit is lower expenses for the homeowner. Today's builders can take advantage of a new generation of cost-effective, high efficiency fixtures and landscape water management systems.

Use energy wisely

New houses in California must be built to the most stringent energy code in the country, but given the state's projected population growth, even this may not be enough to keep demand for energy in check. Generation and use of energy are major contributors to air pollution and global climate change. With homes accounting for roughly 31% of the electricity consumed in the state, it is clear that homebuilders have a significant role to play in helping our society address energy-related concerns now and in the coming decades.

Energy efficiency is the cornerstone of every green home. Improving energy efficiency and using renewable energy sources are effective ways to reduce the potential of energy supply interruptions, reduce the impacts of global warming, and slow the rate at which we need to build new power plants.

Energy efficiency also makes good sense for homeowners: an energy-efficient house saves money by

reducing utility bills year after year, and provides other valuable benefits. Better insulation and double-pane windows, for example, make a home more comfortable and quieter.

Improve indoor air quality

On average, Americans spend 90% of their time indoors, yet the air in new homes can be ten times more polluted than outdoor air, according to the U.S. Environmental Protection Agency. Children are particularly vulnerable when it comes to air pollution. A report in the New England Journal of Medicine states that 40% of children will develop respiratory disease, in part due to the chemicals in their homes.

A common source of indoor air pollution is the offgassing of chemicals found in many building materials. Kitchen cabinets, countertops, shelving and furniture may be made from particleboard or medium density fiberboard. Some of these pressed-wood products are made with adhesives that release urea formaldehyde—a known carcinogen—into the home for years after installation. Also, many paints, floor finishes, adhesives and sealants emit unhealthy volatile organic compounds (VOCs). That "new house smell" is a telltale sign that there are harmful chemicals in the indoor environment.

Fortunately, the building products industry is responding to these indoor pollution problems by developing safer products, including pressed-wood products with no added formaldehyde, and low-VOC paints, cleaners and adhesives. These products are now commonly available from most major suppliers at costs comparable to conventional products. California also now has specifications available for some materials to assure that they are low emitting and safe, including new stringent regulations on formaldehyde emissions from most composite wood materials.

Poor indoor air quality is also often caused by biological contaminants, such as mold that grows as a result of moisture accumulation due to inadequate ventilation, poor design and maintenance, and other factors. Dust, another major source of air pollution inside homes, can be reduced by designing entryways with areas where people can conveniently take off their shoes and by using hard surface flooring materials such as natural linoleum, bamboo, hardwood, concrete or ceramic tile.

Plan for livable communities

California's homebuilders and homebuyers are making decisions today that will affect the quality of our lives for decades to come. New construction, whether of a single home or a large development, contributes to the state's economic vitality and helps meet our pressing need for more housing. At the same time, every new home places additional demands on our supplies of land, water and energy, and on our infrastructure of roads, sewers and other services.

Green building offers homebuilders, community leaders and California residents sensible solutions that improve an individual home's performance and provide broad-based community benefits. These benefits range from cleaner air to reduced traffic congestion, from more appealing recreational opportunities to greater economic vitality.

For local municipalities, green building can provide many economic benefits. Developments designed to reduce dependence on cars help ease traffic congestion, which can improve business productivity. Infill projects help revitalize older urban areas and allow public funds to be used for upgrading existing services such as schools, transit and sewers, rather than diverting limited funds to the development of new services.

For California residents, developments designed to cluster homes help preserve open space for recreation, views and natural habitats. Pedestrian- and bicycle-friendly neighborhoods provide people with opportunities to exercise and get to know their neighbors. Higher density urban infill developments allow people to live closer to where they work, shop and go to school, which means less time spent driving and more time for family, community and personal activities.

Clearly, green building cannot solve all the social, economic or environmental challenges facing California's communities. Still, green building gives homebuilders a valuable set of strategies for meeting residents' expectations for livable, healthy, sustainable communities.

Chapter Two
Building Green Homes

These Guidelines are for developers, builders and homeowners planning to construct one or more single family homes in California. The Guidelines provide a range of green building practices that can be implemented by people who are new to green construction as well as those aiming for higher levels of building performance.

As builders gain experience with green building, many embrace a whole-house systems approach that takes into account the complex interactions of all the building elements. This can result in a higher performing home and cost savings. Many individual green building measures can also reduce costs for both the builder and the homeowner. To give buyers assurance that the home is healthier and more energy- and resource-efficient, builders should consider having their homes GreenPoint Rated.

"GreenPoint Rated has developed the high standards we as builders need to make good individual choices. Third-party verification and a built-in improvement process help ensure we're meeting the standards and providing long-term value."

–Mike Nimon, Wathen Castanos, Inc.

How to Start Building Green

For building professionals, building green involves new ways of thinking about common building practices. Generally, it is best to build from your existing market base, adding green features as the market evolves and matures. If you start gradually, you are less likely to make expensive mistakes. It is critical to carefully consider the changes you make and the additional costs you might incur. The earlier you start integrating green strategies into your building process, the less it may cost you and the consumer in the long run.

Local governments can facilitate green building by providing educational opportunities and considering incentives for better quality construction. Builders value incentives that save them time in the development process or allow them to differentiate their homes in the marketplace. Incentives can include streamlined or expedited permitting, offering community recognition or partnering with organizations that offer consumer marketing programs.

Taking steps toward building green

The measures in these Guidelines range from basic, common-sense recommendations such as the use of engineered lumber, to more sophisticated strategies such as installing renewable energy systems.

No matter where you are on the green building spectrum—from novice to expert—you will find resources, design ideas, and real-world advice that you can put to use today.

If you are new to green building, you can start taking steps right away toward creating healthier and more energy- and resource-efficient homes. Inside these Guidelines, you'll find many strategies that are easy to implement and add virtually no cost.

As your team's experience with green building grows, you'll likely find yourselves scaling up to even healthier and more effective design and construction practices. If you are experienced with building green homes, some of the approaches and practices recommended here may already be part of your daily practice. In that case, these Guidelines will help you employ more advanced green-building strategies that will reinforce your organization's leadership position.

The House as a System

A house is an intricate system made up of interdependent components. Changing one aspect of this system can create a ripple of effects—positive or negative—in other areas. Builders were reminded of this when they began building tighter houses in the 1970s in response to rising energy costs. Tightly sealing the thermal envelope reduced heating and cooling costs but sometimes had unintended results, such as increased indoor air pollution due to inadequate ventilation or problems with mold due to moisture trapped within the structure.

The solution was not to return to the days of leaky, uncomfortable houses that wasted energy. Instead, what grew out of this experience was a new approach to home building, called the whole-house systems approach. In collaboration with building-science researchers, home-building associations and government programs such as the U.S. Department of Energy's Building America, many homebuilders across the nation are now successfully using this approach. It emphasizes strategic planning, systems analysis, and testing and verification to ensure that improvements in one area won't jeopardize health, safety, affordability, durability, profitability and other vital concerns.

Homebuilders should incorporate green building into their practices as part of this whole-house systems approach. This requires taking into account the interaction of many factors: the building's structure and thermal envelope; heating, cooling, water heating and electrical systems; renewable energy systems; the site's climate, topography, landscaping and surrounding structures; aesthetics; health and safety requirements; and how the occupants will use the house.

For example, a green builder concerned with improving the performance of the whole house will not merely select a more energy-efficient heating and cooling system and call it a day. Instead, the builder will look for opportunities to improve the thermal envelope and decrease heating and cooling loads, such as by reducing air leakage, designing and locating ductwork to minimize energy losses, increasing insulation, and performing diagnostic evaluations of the building envelope. These improvements may allow the use of significantly smaller—and less costly—heating and cooling systems. Properly sized HVAC systems also lower the owner's energy costs and provide greater comfort.

Whole-house approach yields multiple benefits

According to Building America, a whole-house systems approach can reduce the energy consumption of new houses by as much as 40% with little or no effect on the cost of construction. Usually the decisions made as part of a whole-house approach yield multiple benefits.

For example, framing the home with 2×6 studs spaced at 24 inches allows increased insulation compared to conventional 2×4 studs spaced at 16 inches. Increased insulation saves heating and cooling energy and improves comfort. Also, as mentioned above, it may allow the downsizing of heating and cooling equipment. What's more, this framing technique reduces wood use.

The whole-house systems approach requires that the design and construction process be highly integrated. This involves:

- Careful planning and attention to detail from the outset of design through all the phases of construction.
- Understanding building science principles, including the principles of air, heat and moisture movement.
- Good communication among the entire team, including the developers, architects, engineers, builders, trade contractors, and material suppliers.
- Proper sequencing of decision-making and building activities throughout the entire design and construction process.
- Adequate training and supervision to ensure quality construction.
- Testing and verifying performance during and after construction, and establishing a feedback loop to improve future designs based on the testing results.

It's no coincidence that green homes designed with a whole-house systems approach are better homes. Improving building performance takes time and care, but can significantly reduce energy needs, improve health and comfort, and reduce builders' risks and costs.

Building America provides detailed information about the whole-house systems approach on their website, www.eere.energy.gov/buildings/building_america.

Cost Considerations

Balancing costs and benefits

These Guidelines recommend methods and materials that range in cost—some of them cost no more or even less than conventional options. In fact, when a home is designed from the outset to be green, it need not cost more than a conventionally built home. While not all measures recommended in these Guidelines will be applicable to every project, the measures included are relevant and reasonable for residential developments built today.

Some of the recommended measures do cost more initially, but this additional cost needs to be evaluated in the context of the longer-term benefits provided: utility cost savings, better indoor air quality for residents, healthier jobsites for workers, and longer building life. When considering green building measures, it is very important to balance upfront design, product and construction costs with these other significant benefits.

How green building can reduce costs

While the health and environmental benefits of green building are well established, some people still assume that green building costs more. But taking a whole-house systems approach to green building, as described on the previous page, can actually reduce construction and operating costs compared to standard practice. This integrated approach to green building can help steer the design away from expensive solutions and toward cost-effective ones.

During schematic design, for example, the team might consider orienting the home on an east-west axis. This can provide multiple whole-house benefits, including facilitating passive solar design, reducing heating and cooling energy and equipment costs, and providing better solar access for rooftop solar electric and solar thermal systems. For many sites, it's a relatively easy to accomplish this during schematic design but it would be a costly change to make once construction documents were underway.

The key to reducing costs is to evaluate opportunities as early as possible in the design process because the range of cost-effective solutions narrows as the design progresses. Consider framing techniques. During schematic design, the design team might decide to incorporate advanced framing techniques. These techniques, as described in the Guidelines, reduce wood and construction costs while maintaining structural integrity and meeting building code. But if framing changes aren't considered until much later in the design or construction process, significant cost and resource-saving opportunities may be missed.

Green building is pushing the design and construction industry to do things that may be new, such as taking a whole-house systems approach to design and construction. Learning new practices sometimes involves an initial outlay of time and money. But green buildings are more than just buildings. They are the end result of collaboration between people on all levels of design and construction who are committed to improving homes for today and the future.

Earning the GreenPoint Rated Label

GreenPoint Rated is an independent seal of approval that helps green homes stand out from the crowd. The GreenPoint Rated label helps home buyers answer the question, "How can I tell if this home really is green?"

GreenPoint Rated removes the guesswork by having a Certified GreenPoint Rater evaluate a home's green features, allowing homes to be compared on a level playing field. GreenPoint Rated rewards building professionals and homeowners who create green homes by allowing them to brand their homes with a recognizable, trustworthy seal of approval.

Think of GreenPoint Rated as a report card for a home. A GreenPoint Rated home is graded on five categories: resource conservation, indoor air quality, water conservation, community and energy efficiency. The individual green building measures within these categories correspond to the measures listed in Chapter Three.

GreenPoint Rated offers two rating systems, GreenPoint Rated New Home for newly built single family and multifamily homes, and GreenPoint Rated Existing Home for remodeling single family projects.

For a new single family home to earn the GreenPoint Rated label, the project must meet the minimum point requirements in each category and score at least 50 points on the Single Family GreenPoint Rated Checklist, as verified by a Certified GreenPoint Rater.

The GreenPoint Rated label provides a numerical score that allows buyers to evaluate and compare the environmental performance of different homes. Because GreenPoint Rated homes are evaluated by independent third-party raters, building professionals and homeowners can feel confident that the rating has integrity and value and the home has met a consistent standard.

For local governments, Build It Green provides strategic assistance in developing, promoting and implementing green building policies and programs. GreenPoint Rated can serve as a mechanism for local governments to incorporate green building into their ordinances and help achieve community sustainability goals.

For more information about GreenPoint Rated, including becoming or finding a Certified Green Point Rater, visit www.BuildItGreen.org/greenpointrated or call 510.845.0472×604.

Pleasant Hill Cohousing Common House, Pleasant Hill, CA

Chapter Three
Green Building Measures

Every green feature in these Guidelines benefits the builder, homebuyer and the environment. This chapter lists each measure, discusses the conditions under which it should be used, and describes the benefits. This chapter also includes brief "Building Basics" articles that review fundamental best practices for green building.

The measures in these Guidelines are not an exhaustive list of all the green elements that could be incorporated into a home. Rather, they are a list of field-tested options that are more likely to be used by custom and production builders. Look for opportunities to go beyond these measures and incorporate innovative techniques and materials that will conserve natural resources and improve the home's energy efficiency, durability and healthfulness.

"We work one-on-one with each client to determine what green features will be incorporated into each custom home we build, directed at maximizing value and comfort."

–Fred Koch, KOCH Development Inc.

What's Inside

This chapter contains the heart of these Guidelines—a description of more than 90 measures, or best practices, for building green. The measures are grouped into sections generally corresponding to the various stages of construction. This organization will help you understand which green building measures can be incorporated at appropriate stages of construction.

Although the measures are listed individually, it's essential that each one be considered in terms of its relationship to and effect on the design of the whole house. The Guidelines also include some "Building Basics" articles that provide more details on fundamental concepts.

The sections are briefly summarized below. This 2009 edition includes new measures that reflect advances in green building and the 2008 update to California's Building Energy Efficiency Standards (Title 24); measures that have been adopted as code have been removed from the Guidelines. Significant changes to the Guidelines are noted below.

A. SITE

Site measures include recommendations for managing the construction process to minimize disruptions to the building site, reduce waste, and prevent pollution of air, soil and waterways. A new measure has been added, Create a Cool Site, with strategies for mitigating the heat island effect.

B. FOUNDATION

New-home builders have the opportunity to make the buildings green from the ground up. This section includes suggestions for incorporating recycled content in concrete, recommendations for foundation design and crawl space construction, and information on radon mitigation, pest control and moisture management. Two new measures have been added: Install a Foundation Drainage System and Control Moisture in Crawl Spaces.

C. LANDSCAPING

These measures offer strategies for creating landscapes that use less water, conserve resources, promote healthy soils, create fire-safe landscaping, and reduce excessive outdoor lighting. A number of new measures have been added, reflecting the increasing urgency of water conservation in California: Install a Rainwater Harvesting System, Use Recycled Water for Irrigation, Use Submeters for Irrigation, and Design Landscape to Meet Water Budget.

D. STRUCTURAL FRAME AND BUILDING ENVELOPE

These measures provide energy- and resource-efficient strategies for building the structural frame and envelope, including the walls and roof. Following these recommendations will result in more durable buildings and less waste. Two measures have been added: Manage Construction Materials Efficiently and Use Insulated Headers.

E. EXTERIOR FINISH

This section focuses on siding, roofing and decking materials that are durable and help protect the home from moisture damage and fire. A new measure has been added that emphasizes the importance of quality construction to minimize moisture damage: Specify Flashing Installation Techniques and Verify Installation.

F. INSULATION

The measures in this section encourage the use of insulation products with recycled content and low or no formaldehyde emissions. Diagnostic evaluations and inspections are now covered in more depth in Section J.

G. PLUMBING

This section addresses ways in which builders can save water and energy by designing the plumbing system to distribute hot water efficiently, and by installing water-efficient faucets, showerheads and toilets. The measure, Install Water-Efficient Faucets and Showerheads, is new to this edition.

H. HEATING, VENTILATION AND AIR CONDITIONING

These measures address two main and complementary benefits: energy efficiency and better indoor environmental quality. Included are considerations for furnaces, air conditioners, water heaters, mechanical ventilation, ductwork, and fireplaces. This section contains a new measure that recommends performing

diagnostic tests on the HVAC system. The mechanical ventilation measures have been updated to reflect changes in Title 24.

I. RENEWABLE ENERGY

These measures provide information about how to include renewable energy systems (solar electricity, solar thermal, and wind energy) in single family homes.

J. BUILDING PERFORMANCE

This section has been significantly updated to reflect more advanced green building practices. It provides recommendations for designing and building energy-efficient homes that exceed California's code requirements and recommendations for third-party home performance testing and certification. It now also includes a recommendation for using certified preparers for Title 24 documentation, a measure addressing utility programs for third-party review of plans, and information on designing and building near zero energy homes.

K. FINISHES

Many conventional interior materials, including particleboard, paints and sealants, offgas noxious chemicals into the home. Most of the measures in this section describe healthier options for paints, trim, cabinets and countertops that perform well and are readily available. Other measures promote environmentally preferable materials for interior finishes.

L. FLOORING

These recommendations address a wide range of flooring materials that are durable and environmentally friendly.

M. APPLIANCES AND LIGHTING

This section recommends choosing dishwashers, clothes washers, and refrigerators that exceed minimum federal efficiency standards, which can significantly cut a home's energy and water use. It also provides information on built-in recycling/composting centers, and includes a new measure recommending the use of high efficacy lighting.

N. OTHER

The measures in this section encourage approaches to green building that are not included in the other sections. These practices include GreenPoint Rated documentation, preconstruction team meetings, green building professional certification, homeowners' manuals, and energy and water monitoring systems.

O. COMMUNITY DESIGN AND PLANNING

These measures include strategies to help preserve open space and utilize existing infrastructure, design subdivisions for solar access, promote social interaction and community safety, and make homes more accessible to people of all physical abilities. A new measure has been added, Build on Designated Brownfield Sites.

A. Site

1. Protect Topsoil and Minimize Disruption of Existing Plants and Trees

DESCRIPTION

Soil is a valuable, living resource that should be protected. Through careful planning and construction practices, topsoil as well as mature trees and other plants can be preserved.

APPLICATION

Limit and delineate the construction footprint; restrict vehicles and heavy equipment that compact soil to areas that are or will be paved or built over.

Design for minimum building and hardscape footprints and minimize grading. When grading is unavoidable, remove and stockpile any topsoil that's horticulturally suitable for reuse and store it in areas that will be paved later. Protect all soil from erosion.

After construction, evaluate the quality of the stockpiled soil, amend with compost, as appropriate, and re-spread. Any new soil that needs to be added should be similar to existing soil in pH, texture, permeability, and other characteristics, unless soil analysis reveals that a different type of soil is appropriate.

Complete a landscape survey to determine the feasibility of preserving or relocating mature trees, shrubs and native vegetation. Protect trees and shrubs from construction equipment by placing temporary fencing beyond their driplines. Create or preserve wildlife corridors adjacent to open space, wild lands and creeks.

BENEFIT

Plants thrive in healthy soil. Healthy soils can also significantly reduce stormwater runoff, reduce fertilizer and pesticide requirements, improve water quality and reduce water needed for irrigation. Protection of existing mature landscape features helps prevent soil erosion, keeps the home and surrounding environment cooler in the summer, preserves nature and adds value to the community.

BUILDING BASICS

PASSIVE SOLAR HOMES

Passive solar design can make homes more comfortable and greatly decrease energy used to run heating and cooling systems. Some of the energy benefits derived from passive strategies can be evaluated using California Building Energy Efficiency Standards (Title 24) compliance models.

A list of passive solar strategies follows. Each of these strategies is closely linked to many other aspects of the home's performance; be sure to approach the design process from an integrated, whole-house perspective. For related information about building near zero energy homes, see measure J3 of these Guidelines.

a. Orient homes to optimize solar access.

Plan subdivision lots and street layout to optimize solar access for all homes. Orient the home with the long axis running east-west and minimize east- and west-facing windows to improve passive solar performance. See measure O4 for more information.

b. Improve thermal mass.

Use wall and floor materials that improve thermal mass and moderate temperature swings. For additional information, see measure L2.

c. Improve cross ventilation.

Design windows to catch prevailing breezes and provide cross ventilation. Install high windows, operable skylights or cupolas and securable low windows. This will help create a stack effect to draw in cooler outdoor air from the lower windows and exhaust rising hot air from the upper openings.

d. Shade the home.

Incorporate roof overhangs, awnings, trellises and shade trees to control solar heat gain through windows. For more information, see measures C5 and D8.

e. Reduce solar gain.

Use light exterior colors or paints with reflective pigments, Energy Star roofing materials, cool roof strategies, and/or radiant barrier roof sheathing. Roofing materials are available that have a reflectance greater than 0.75 and an emittance greater than 0.70. Install energy-efficient windows (double-paned, low-conductivity frames and low-e coating). See the Building Basics article, "Energy Code Compliance," for more information about windows.

2. Divert/Recycle Construction Waste (Including Green Waste and Existing Structures)

DESCRIPTION

Each year, close to nine million tons of construction and demolition (C&D) debris is disposed of in California landfills. This represents 22% of the statewide waste stream, but in newer communities C&D waste sent to landfills can be as high as 50%. Construction waste generally consists of wood, drywall, metal, concrete, dirt and cardboard. It can also include plant debris (green waste). Much of this material can be reused or recycled.

APPLICATION

Identify the types and quantities of materials generated at the jobsite during both demolition and construction. Determine what can be reused on the current project or on another project and what can be recycled. Cardboard, concrete, asphalt and green waste can almost always be recycled. At least 50% of the construction materials, including green waste, should be recycled. One strategy is to sort materials on the jobsite and allocate space for recycling bins and storage areas for reusable materials. Train workers on appropriate disposal of materials.

Contact local recycling facilities and haulers to identify terms and conditions required for recycling materials. Contact the California Integrated Waste Management Board (www.ciwmb.ca.gov) for more information on recycling facilities.

Deconstruction of existing buildings is a good way to salvage quality building products that have not yet reached the end of their usable life, even if the building or part of it has. Salvaged materials may be less expensive, of higher quality, or have more character than new materials.

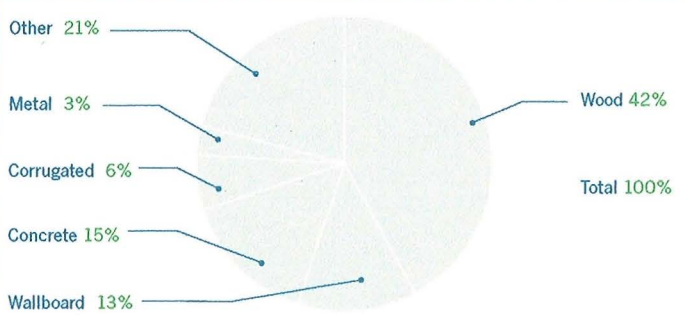
Whole house deconstruction requires a team of workers experienced in dismantling buildings. Locate a demolition contractor who offers deconstruction services or an organization that specializes in deconstruction. In some cases, deconstruction may cost more than demolition, but donating the salvaged materials to a nonprofit may result in a substantial tax deduction that can offset the cost.

Common salvageable materials include timber, doors, sinks, fencing, bricks, tile, hardware and light fixtures. Reclaimed lumber, in the form of studs, beams, flooring and trim, is among the most valuable and available of salvaged building products.

BENEFIT

Reuse and recycling of construction debris conserves natural resources and reduces the burden on landfills. In addition, builders can save money with lower disposal fees for recyclable materials. Reusing building materials typically generates less waste and pollution than recycling does and eliminates disposal costs.

Construction Waste Generated from a 2,000-Square-Foot New Home



Source: Based on waste generation studies for three residential developments in Alameda County (1999–2004) and compiled by Matthew J. Southworth, P.E., Civil Engineer.

3. Use Recycled-Content Aggregate

DESCRIPTION

Virgin aggregate comes from sources such as riverbeds and

quarries where mining activities disturb the environment. Recycled aggregate consists mainly of crushed concrete and asphalt pavement. Recycled concrete and asphalt crushed to ¾-inch meets the California Department of Transportation's (Caltrans) specification for Class 2 Aggregate Base.

APPLICATION

Use wherever Class 2 aggregate is specified; for example, under driveways, sidewalks and building slabs.

BENEFIT

Recycled aggregate allows waste materials to be reused, eliminating materials from the waste stream.

4. Create a Cool Site

DESCRIPTION

The term "heat island" refers to places with large areas of hardscape and buildings. The asphalt and concrete absorb and radiate heat, increasing ambient air temperatures. Cities create heat islands, as do many suburbs. Cool site measures that increase the site's reflectivity and shading help combat the heat island effect.

APPLICATION

Install light-colored and/or highly reflective materials for the site's impervious surfaces. Design and install shading elements such as overhangs, trees and shrubs (or preserve existing trees and shrubs) to shade sidewalks, patios, and driveways. Pervious paving or concrete also helps mitigate the heat island effect through evapotranspiration. Providing covered parking (such as tuck-under parking or a parking area shaded by a trellis) as opposed to uncovered surface parking reduces the hardscape area. Solar electric panels, solar thermal panels, and vegetated roofs may also provide additional shading and cooling.

BENEFIT

Cool site measures reduce the heat island effect, which in turn reduces air conditioning use and greenhouse gas emissions. For cool roofing materials, refer to California's Building Energy Efficiency Standards (Title 24) and the Cool Roof Rating Council (www.coolroofs.org).

5. Carry Out an Environmental Quality Management Plan and Preoccupancy Flush-Out

DESCRIPTION

Indoor air at construction sites is often contaminated by toxins from building materials such as adhesives, sealants and paints, as well as by construction dust and other particulates. Carrying out an Environmental Quality Management Plan can improve the air quality at the construction site and protect construction workers' health. A preoccupancy flush-out of the HVAC system can help protect the residents' health.

APPLICATION

Write an Environmental Quality Management Plan that specifies proper sequencing of construction activities, jobsite cleaning, covering and sealing duct registers during construction, and protecting absorptive materials stored on site.

Debris and dust from construction can lodge in HVAC equipment and ducts, potentially causing residents to have allergic reactions and reducing the effectiveness of the blower fan and heating/cooling elements. As soon as the ducts are installed, completely seal each duct register and the HVAC unit to prevent any construction dust from entering the system. Use methods and materials that will stay in place and be maintained throughout the construction process. After construction is completed, clean all ducts by vacuuming the blower unit and duct registers before occupancy. Conduct a preoccupancy flush-out with 100% outside air before the home is occupied.

For more information on best practices for construction environmental quality management, see the U.S. EPA's IAQ Design Tools for Schools (www.epa.gov/iaq/schooldesign/construction.html) and the Sheet Metal and Air Conditioning Contractors' National Association website (www.smacna.org).

BENEFIT

These practices reduce the particulates and toxins created and released indoors on the jobsite, and flush the home of air pollutants prior occupancy.

B. Foundation

1. Replace Portland Cement in Concrete with Recycled Flyash or Slag

DESCRIPTION

Cement production is energy intensive; it accounts for more than 6% of the world's anthropogenic carbon dioxide emissions.

Flyash is a byproduct of coal-burning power plants. It is typically landfilled, but can be an inexpensive and quality substitute for a portion of the Portland cement in concrete. Concrete suppliers routinely replace 10–15% of the Portland cement in their mixes with flyash. Slag, a byproduct of the steel industry, may also be used like flyash to replace some of the cement.

APPLICATION

Up to 50% of cement can be replaced with flyash or slag in many residential concrete mixes. High volume flyash or slag mixes (35% replacement or more) may require longer cure times and different finishing techniques than standard concrete. Consult a structural engineer for information.

BENEFIT

Flyash and slag improve the performance of concrete by increasing strength, reducing permeability and reducing corrosion of reinforcing steel. Using flyash or slag also reduces the amount of water and cement needed, thereby decreasing the overall environmental impacts of concrete production.

2. Use Frost-Protected Shallow Foundation in Cold Climates

DESCRIPTION

Foundations in cold climates are typically quite large, sitting deep below the frost line to reduce the possibility of heaving damage from the freeze-thaw cycle. A frost-protected shallow foundation (FPSF) is surrounded by insulation, which, in effect, raises the frost line to just below the surface, allowing reduced excavation and foundation wall depths.

APPLICATION

This measure applies only to Climate Zone 16. Excavate the foundation perimeter to 16 inches rather than the 36 to 48 inches typical for cold climates. Place insulation horizontally 4 feet extending out from the foundation, against the outside face of the foundation wall, and under the entire slab.

BENEFIT

An FPSF typically results in a reduction of both concrete use and labor of up to 40%. Reducing excavation activities minimizes compaction and disturbance of the soil by vehicles. Finally, the insulation under an FPSF can significantly moderate the foundation temperatures, making the home more energy efficient and comfortable.

3. Use Radon-Resistant Construction

DESCRIPTION

Radon gas is naturally emitted by some soils and rocks. The U.S. Environmental Protection Agency estimates that exposure to radon may be the second leading cause of lung cancer, after cigarette smoking. In California about 1% of homes have radon levels above the recommended mitigation level (4 picocuries). Most of these homes are located in the Sierra foothills and coastal mountains and foothills.

APPLICATION

Use radon-resistant construction if building a home in EPA Radon Zone 1 (www.epa.gov/radon/zonemap/california.htm) or in an area identified by the California Department of Health Services as having above average risk (www.cal-iaq.org/RADON). Lay a perforated pipe in a 4- to 6-inch layer of large gravel under the foundation slab. Connect this to a solid pipe running to the attic and through the roof for passive radon discharge. To actively discharge radon, attach a fan to this pipe.

Even in areas of medium to low risk for radon, some homes have high radon levels (especially homes with rooms below grade). The U.S. EPA has information about where to purchase inexpensive radon test kits (www.epa.gov/radon/radontest.html).

BENEFIT

Installing a radon mitigation system may significantly reduce the residents' levels of radon exposure.

4. Install a Foundation Drainage System

DESCRIPTION

A comprehensively designed and installed perimeter foundation drainage system will divert surface and subsurface water away from the house, and limit water seepage through the foundation walls or slab and into the crawl space or basement.

APPLICATION

Best practices for a foundation drainage system include a perimeter drain for all footings and a waterproof membrane and deliberate drainage plane on the exterior of all foundation walls. Specify these design details on the building plans. This measure is appropriate for homes with slab foundations, crawl spaces or basements.

BENEFIT

A foundation drainage system will increase the durability of the home's foundation by draining water away from the structure.

5. Control Moisture in Crawl Spaces

DESCRIPTION

A moisture-controlled crawl space reduces the amount of moisture migrating from the soil in the crawl space to the home's structure and interior.

APPLICATION

Install a continuous vapor barrier with properly sealed, overlapping joints in crawl spaces according to best practice methods. The vapor barrier should be at least 6-mil, should be white (not translucent), and should cover the floor and extend up the foundation walls. Seal all penetrations in the vapor barrier.

BENEFIT

Vapor barriers improve indoor air quality and the structure's durability by reducing moisture migration into the home from the crawl space.

6. Use Structural Pest Controls

DESCRIPTION

Pests are attracted to moisture, darkness, food and rotting wood. Ants, termites and other pests can damage cellulose-based building materials. Some chemical treatments designed to deter pests may also be toxic to humans and other animals. Permanent, structural pest controls can obstruct typical pathways that pests use to enter the home.

APPLICATION

a. Install Termite Shields and Separate All Exterior Wood-to-Concrete Connections by Metal or Plastic Fasteners or Dividers

Install a continuous, durable termite shield around all foundation slab penetrations (such as pipes), at the junction of the foundation or piers and the wall framing, and wherever slab perimeter insulation is installed.

When structural wood elements (such as posts, stairs and decks) are in contact with concrete or soil, they remain moist for prolonged periods. Create a separation to allow water to drain and wood to easily dry out.

b. Locate All New Plants At Least 36 Inches from Foundation

Maintaining this minimum distance keeps roots away from the foundation, reduces the chance of pests traveling from nearby branches onto the home, and allows the homeowner to more easily inspect for termite tunnels around the home's foundation wall.

Other effective strategies include making framing materials difficult for pests to reach by keeping the soil adjacent to the foundation away from the home's framing and siding. For new construction, the distance between the soil and the framing/siding materials should be at least 12 inches.

Also consider using low toxicity, borate-based wood preservatives on oriented strand board (OSB), plywood, or lumber to deter pests. Borates are naturally occurring mineral preservatives that are not appetizing to carpenter ants and termites, thus protecting the wood from pest damage. Another option is to use building materials that do not contain cellulose.

BENEFIT

Physical pest controls are permanent controls that reduce the need to use chemicals. They also increase the durability of the home's structural elements, reducing the time and money needed for repairs. Nontoxic pest controls help protect the building from pest damage while also protecting human health.

C. Landscaping

1. Group Plants by Water Needs (Hydrozoning)

DESCRIPTION

Hydrozoning is the process of creating irrigation zones, with plants requiring little water placed in zones separate from those requiring more water. The goal is to reduce water use by supplying the appropriate amount of water to each irrigation zone.

APPLICATION

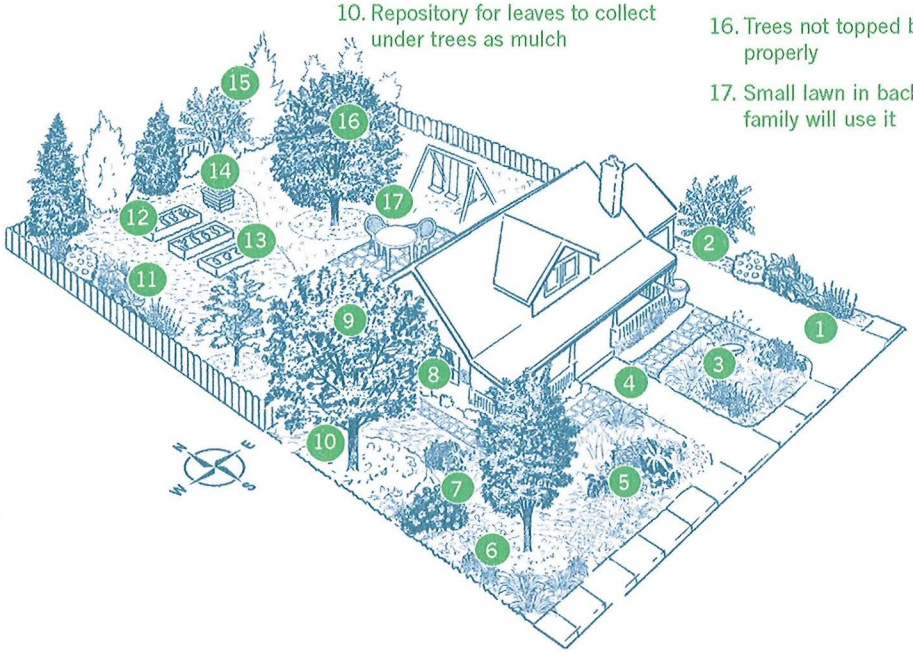
Group plants into hydrozones by separating plants with low and high water requirements and creating separate irrigation zones based on these water requirements. Delineate each hydrozone on the site plan, irrigation plan, and planting list. Place plants with higher water needs in relatively small areas and in spots that naturally collect water. Place plants with low water needs throughout the majority of the landscape. Install separate irrigation valves for different zones. Consider that some California native plants do not tolerate water in the summer after they are established and should be separated from plants that need ongoing irrigation.

BENEFIT

Hydrozoning matches irrigation to the plants' water requirements, conserving water and fostering resistance to pests and disease. Hydrozoning also reduces plant mortality, which saves time and money.

Elements of a Sustainable Residential Landscape

1. Permeable paving on driveway and walkway to front door
2. Water from roof channeled to cistern
3. Water for wildlife habitat
4. Pavers with spaces and low water use plants between
5. Front lawn replaced by diverse plantings with many California native groundcovers, shrubs and trees, but no invasive species
6. All plants given the space to grow to their natural size
7. Plants selected to match the microclimates
8. Irrigation controller waters hydrozones according to plant needs, soil moisture and weather
9. Deciduous trees placed to the west & southwest of the house & patio for summer cooling
10. Repository for leaves to collect under trees as mulch
11. Mulched paths keep soil covered
12. Drip irrigation for vegetable beds, shrubs, trees and elsewhere where feasible
13. Raised beds are constructed from plastic or composite lumber
14. Compost bin recycles plant and kitchen debris
15. Evergreen windbreak blocks north winter winds
16. Trees not topped but pruned properly
17. Small lawn in backyard where family will use it



BUILDING BASICS

STORMWATER

Land development and construction activities can significantly alter natural drainage patterns and pollute stormwater runoff. Increases in impervious surfaces can reduce water quality in nearby creeks, rivers, lakes and bays. In fact, according to the U.S. EPA, 11 million gallons of oil are carried into U.S. waterways each year from stormwater runoff. That's the equivalent of an Exxon Valdez oil spill!

Controlling stormwater runoff is critical to protecting water quality. Excessive stormwater runoff can erode residential landscapes and local streams, and stress local stormwater drainage systems, increasing flood risks. Keeping sediment and pollutants out of storm drains helps protect local creeks, reservoirs and the ocean.

Many construction projects will need to file a Notice of Intent (NOI) and prepare a Stormwater Pollution Prevention Plan (SWPPP) per the State General Construction NPDES Permit. Be sure to contact your local municipality for during-construction and post-construction stormwater quality control requirements.

During grading and construction, use stormwater Best Management Practices (BMPs) to control erosion and prevent sediment and pollutants from entering storm drains. Erosion control protects the soil surfaces whereas sediment control traps soil particles after they have been dislodged. Consider implementing these BMPs during construction:

a. Plan grading to minimize runoff.

Schedule grading so that disturbed slopes are stabilized and replanted during the non-rainy season. Minimize and delineate the area to be disturbed.

b. Control sediment.

Trap sediment on site using a combination of effective erosion and sediment control measures. Place barriers around storm drain inlets to pond water and allow sediments to settle out.

c. Store materials properly.

Cover construction materials and stored topsoil exposed to rain; store wastes under cover and dispose of properly.

d. Keep concrete out of storm drains.

Install temporary concrete washout areas for use by contractors to prevent concrete waste from entering storm drains.

e. Train workers.

Educate on-site workers to follow good housekeeping practices and implement best management practices to prevent stormwater pollution.

f. Check and recheck.

Inspect and maintain control measures before and after each rainstorm and throughout construction.

Low Impact Design

Local municipalities require projects creating or replacing a significant amount of impervious surface area to capture and treat 80 to 90% of runoff. Many builders install manufactured stormwater management products. In most cases, more environmentally friendly alternatives exist, including these low impact, landscape-integrated, distributed strategies:

2. Mulch All Planting Beds

DESCRIPTION

Mulch is protective material placed over the soil, primarily to increase the soil's ability to absorb and retain moisture. Organic mulches such as chipped landscape debris also supply nutrients and provide wildlife habitat; they are preferable to inorganic mulches such as gravel.

APPLICATION

Apply and maintain a minimum of 2 to 3 inches of natural mulch to all soil surfaces or at least until plants grow to cover the soil. Do not place mulch directly against any plant stem or tree. Designate areas under trees and away from hardscapes or storm drains as repositories for fallen leaves to remain as mulch. Buy mulch produced from urban plant waste debris, or from local suppliers.

BENEFIT

Mulch can conserve water, moderate soil temperature, reduce weed growth and simplify maintenance operations.

3. Construct Resource-Efficient Landscapes

DESCRIPTION

Conventional residential landscapes are often designed without regard for climate and soil conditions. Typically, they require high inputs of water and chemicals and produce excessive plant debris from shearing and mowing activities. Invasive plants used in landscaping often escape into natural areas, where they can spread rapidly, crowd out native

a. Increase opportunities for stormwater to percolate into soil.

Minimize the total amount of impervious paved area used for roadways, driveways, walkways, and patios by avoiding large expanses of contiguous impermeable surfaces. If the project includes street design, use curb cuts to allow runoff from the street to enter the landscape area or have the driveway bridge a swale that runs parallel to the street. If applicable, include "Drains to Bay" or "Drains to Creek" signage at drains to discourage people from pouring chemicals into the drains.

b. Choose permeable hardscape surfaces.

For hardscape surfaces, use gravel, pervious concrete, pervious asphalt or other pervious materials, reinforced grass paving, or driveway tire strips rather than a solid concrete driveway so that stormwater can infiltrate into the ground, allowing for groundwater recharge. When choosing a permeable surface, consider Americans with Disabilities Act (ADA) requirements, as well as the anticipated vehicular load. Areas with very high traffic or very heavy loads may not be suitable for pervious paving.

c. Design areas to receive stormwater runoff.

Direct stormwater runoff from hardscapes toward adjacent landscaped areas that are graded to receive excess water; this will help recharge groundwater, filter pollutants, and water vegetation. Keep trees out of the stormwater flow line to prevent their roots from being inundated, and set buildings and hardscaped areas away from waterways.

d. Minimize pollutants on site.

Choose non-leaching roof materials (such as clay/slate tiles, untreated wood shakes, steel, concrete or fiber-cement) rather than leaching materials like copper or asphalt.

e. Direct roof runoff to the soil.

Route the downspout from the roof through permeable landscaping or swales. Instead of connecting the downspout to the storm drain with solid pipe, connect it to a perforated pipe to allow for infiltration into the ground. In urban areas, route the downspout through planters; be sure to include an overflow.

f. Capture rainwater.

Construct rainwater catchment systems such as rain gardens, ponds, cisterns and other rainwater collection basins. A rain garden is a shallow, depressed garden with an overflow system like perforated pipe or a gravel bed. Production builders may consider creating a living pond, if appropriate, rather than a concrete pond. The pond's natural chemical, physical and biological processes remove suspended solids, metals and dissolved nutrients.

g. Use biofilters to slow runoff and trap pollutants.

Create a biofilter, such as a vegetated swale, dry swale or filter strip, to slow the flow of stormwater into storm drains and allow pollutants to settle out to reduce sedimentation and other pollutants in the water. Before sizing bioretention and filtration systems, conduct a soil infiltration test. Well-draining, sandy loam soil is ideal. Consider hiring an expert, such as a landscape architect or civil or geotechnical engineer to help with system sizing and design.

h. Control irrigation.

Install irrigation controls with rain sensors to prevent unnecessary runoff from irrigation and erosion of soil.

plants, degrade wildlife habitat and increase the wildfire fuel load. Resource-efficient landscapes use plants and techniques that are better suited to local soils, wildlife, rainfall and climate.

APPLICATION

Select drought-tolerant plant species that are appropriate for the site's soil and microclimates, such as California natives, and Mediterranean or other well-adapted species. Plant a variety of trees, shrubs and other perennials, and limit annuals. Find out which invasive species are problematic locally; do not include them in the planting palette and eliminate any from the site before planting. See the California Invasive Plant Council website (www.Cal-IPC.org) for a list of invasive species in your area.

Give plants plenty of room to mature, reducing the need for pruning and shearing. Limit turf to the smallest area that will meet recreational needs (see Minimize Turf Areas, below). Include a site for composting and mulching plant debris.

BENEFIT

A diverse landscape of native species supports beneficial birds, bees and other insects and may resist disease and other pests better than one with little variety. Choosing and placing plants appropriately will also reduce the amount of plant debris sent to landfills and water used for irrigation.

4. Minimize Turf Areas

DESCRIPTION

Lawns (or turf) are useful for recreation and relaxation, but turf requires frequent cutting, watering and application of fertilizers or other chemicals to stay green during California's long dry season.

APPLICATION

Replace decorative lawns with water-conserving California native groundcovers or perennial grasses, shrubs and trees. If lawns are desired, plant in small areas where they are most likely to be used for play and relaxation. Choose plant species that are native or regionally appropriate and have a water requirement less than or equal to tall fescue. Avoid planting turf on slopes greater than 10% or in irregularly shaped areas that cannot be irrigated efficiently. Avoid turf in isolated areas (driveway strips) or other areas less than 8 feet wide, unless irrigated with subsurface irrigation or micro spray heads.

BENEFIT

Minimizing turf conserves water. If a 1,000-square-foot lawn needs 1 inch of water per week, reducing it to 500 square feet can save approximately 10,000 gallons of water per dry season. Minimizing turf reduces the need for mowing. Chemical use may also be decreased, thereby protecting the quality of local waterways and aquifers.

5. Plant Shade Trees

DESCRIPTION

During summer months, direct sunlight heats up homes, which makes air conditioners work harder and drives up peak electricity demand. Large shade trees keep direct sun off the roof, walls, and windows in the summer, thereby lowering cooling costs and increasing comfort while providing an attractive landscape.

APPLICATION

Augment the existing tree cover on the site, particularly to the west of the building, by planting a variety of California native or Mediterranean tree species that are drought tolerant, appropriate for the site's soil and microclimates, have room to mature, and have limited shearing requirements. Plant trees to shade walls, windows and paved areas. If the building design includes passive solar heating, calculate the shading effects of trees on the home's south side; consider planting deciduous trees (see the Building Basics article, "Passive Solar Homes," in these Guidelines). If the building design includes photovoltaic or solar thermal systems, do not plant trees where they will shade panels now or in the future. Avoid planting trees close to utilities.

BENEFIT

Shade trees can create a microclimate that is up to 15°F cooler than the surrounding area, and can reduce summer air-conditioning costs by 25 to 40%. Peak electricity demand is at its highest during late afternoons in the summer; shade trees play an important role in reducing this demand. Trees provide numerous additional benefits including absorbing carbon dioxide, retaining and treating stormwater, cleaning the air, creating habitat, providing play places for children, making neighborhoods more beautiful and increasing property values.

6. Install High Efficiency Irrigation Systems

DESCRIPTION

With increasing demand on supplies of fresh water, efficient landscape irrigation is vital in California. Efficient irrigation systems apply only the amount of water that the plants need, with little or no waste through runoff, overwatering or misting.

Drip and bubbler irrigation technologies apply water to the soil at the plant root zones at the rate the soil can absorb it, and are often more appropriate than overhead sprinklers in areas that are narrow, oddly shaped or densely planted such as parking lots and medians. Low-flow sprinkler heads apply water uniformly and slowly. Smart controllers regulate the irrigation schedule based on current weather data or sensors. A rain sensor overrides the system in the event of rainy weather.

APPLICATION

Design the irrigation system to meet or exceed the requirements of your local water conservation ordinance. Install drip, subsurface drip or low-flow sprinklers in place of standard systems for all landscape applications.

A smart irrigation controller will provide even more water savings. Choose a smart irrigation controller that has at a minimum the following capabilities: 1) water budgeting feature, 2) automatic periodic adjustments to the irrigation program, accomplished through

external sensors or a provider-supplied weather data signal, 3) multiple start times, 4) run-times able to support low-volume applications, 5) irrigation intervals for days of the week or same-day intervals, and 6) more than one irrigation zone (for example, A=turf, B=shrubs, C=water features). If appropriate, turn off the irrigation system or valve for the landscape or hydrozone that includes only low water use California natives, once the plants are fully established.

BENEFIT

High efficiency irrigation systems minimize overspray and evaporation and reduce runoff, dramatically reducing landscape water use while preventing disease and minimizing weed growth that results from overwatering.

7. Add Compost to Promote Healthy Topsoil

DESCRIPTION

A robust, living soil with sufficient organic content is the foundation of a water-conserving, resource-efficient, thriving landscape. Adding good quality compost before planting brings life to the soil and feeds existing soil organisms, fueling many natural processes that supply nutrients, minimize disease and improve soil quality.

APPLICATION

Assess the soil quality on site. Have the soil professionally analyzed for texture, nutrient and organic matter content, and pH, especially if the topsoil was not protected during construction activities. If soil amendments are advised, ask the laboratory to recommend environmentally friendly amendments. Incorporate 2 to 4 inches of compost into the top 6 to 12 inches of soil, or as much as is required to bring the soil's organic matter content to 3.5% for turf and 5% for planting beds, as appropriate for particular plant species. Use fully stabilized, certified compost as a soil amendment where appropriate (stabilized compost has been properly matured and can be safely handled, stored and applied to the soil). Loosen all planting and turf areas to a minimum depth of 6 inches prior to final landscape grading. Use compost to topdress turf and around established shrubs and trees.

BENEFIT

Compost can increase permeability, water retention and plant nutrient availability. This encourages healthy plant growth, improves the ability of the soil to filter pollutants, improves water quality, reduces irrigation needs and lowers water bills.

8. Install a Rainwater Harvesting System

DESCRIPTION

Rainwater harvesting systems collect and store stormwater from a building's roof and/or site to be used for landscape irrigation. If disinfected and filtered, it can also be used for toilet flushing.

APPLICATION

In a simple system, rainwater is collected from the roof downspout into a container such as a cistern or tank. The container has a hose bib at the bottom, which can be used for hand watering. More sophisticated systems have pumps and may be connected to the landscape irrigation system or treated and filtered to be used to flush the building's toilets.

BENEFIT

Rainwater harvesting reduces the use of potable water and reduces demand on municipal water supply and treatment systems. It also decreases stormwater runoff.

9. Use Recycled Water for Irrigation

DESCRIPTION

Use recycled wastewater supplied by the local municipality for the home's landscape irrigation system.

APPLICATION

Install a purple pipe system that takes treated recycled wastewater from the municipality and uses it exclusively for the home's irrigation system. Check with your municipality; recycled water is not yet available in all communities.

BENEFIT

Using recycled wastewater for irrigation reduces potable water use.

10. Use Submeters for Irrigation

DESCRIPTION

An irrigation submeter is a separate water meter that calculates water flow from irrigation or other outdoor water uses, not indoor water use.

APPLICATION

Install an irrigation submeter combined with irrigation controllers to measure water use. An irrigation submeter can also help with leak detection and will help maintain a water budget (see measure C11). Check with local utilities for rebates for submetering.

BENEFIT

Irrigation submeters encourage water conservation by allowing the homeowner to monitor how much water the irrigation system uses.

11. Design Landscape to Meet Water Budget

DESCRIPTION

A water budget is an advanced approach to designing a water-efficient landscape. Water budgets take into account variables such as evapotranspiration rates, plant characteristics, irrigation efficiency, and site area. Starting in 2010, the State of California will require local jurisdictions to adopt water budget ordinances that will require new construction to comply with specific requirements for the installed landscape. The ordinance addresses performance standards and labeling requirements for landscape irrigation equipment to reduce inefficient or unnecessary water or energy use.

APPLICATION

Design and build a landscape with an irrigation system that will be operated at a water budget of ≤.70 Reference Evapotranspiration (ETo). Landscape professionals must use an approved methodology provided in the ordinance to estimate the amount of water that will be needed by a particular landscape design on a specific site; that design can then be compared to an allowable water use (or water budget). To ensure the water budget is met, incorporate hydrozoning, high efficiency irrigation, a native plant palette and other best practices described in these Guidelines.

Information about the model ordinance can be found on the Department of Water Resources website, www.owue.water.ca.gov/landscape/ord/updatedOrd.cfm/. For more specific technical resources, see the California Irrigation Management Information System website, www.cimis.water.ca.gov/cimis/welcome.jsp.

BENEFIT

Establishing a water budget and taking appropriate measures to meet the performance target will result in a landscape design that can significantly reduce irrigation water use.

12. Use Fire-Safe Landscaping Techniques

DESCRIPTION

California's hot, dry climate makes fire protection an important consideration for landscape design, especially because new home developments are increasingly located adjacent to areas that may be prone to wildfires. Simple landscaping design practices can help defend the homes by reducing fuel accumulation and interrupting the fire path.

APPLICATION

Check with your local jurisdiction to determine whether the site is in a high-risk area. Map the site, identifying exposure to prevailing winds during the dry season and steep slopes that can increase wind speed and convey heat. Identify adjacent wildlands or open space, as well as south- and west-facing slopes and their vegetation, particularly species that burn readily.

For sites adjacent to fire sensitive open space or wildlands, create defensible space around buildings; this is an area where vegetation is modified to reduce fuel load and allow firefighters to operate. Use irrigated, low-growing, fire-resistant vegetation, patios, paving stones and other low-risk features in the zone immediately surrounding the structure. Specify plants with low fuel volume and/or high moisture content. Avoid plants with high oil content or that tend to accumulate an excessive amount of dead wood or debris.

Landscape before and after an upgrade that reduced lawn size, increased diversity, improved property values, cut water bills by 50% and reduced maintenance costs by 20%.

Do not plant trees and shrubs at distances where limbs and branches will reach the house or grow under overhangs as they mature. To minimize fire ladders, do not plant dense hedges or space tall vegetation too closely together. Use mulch (except fine shredded bark) and decomposed granite to control weeds and reduce fuel for fires. Construct roofs, siding and decks with fire-resistant materials. Consider alternatives to wood fences, such as rock walls.

BENEFIT

Fire-safe landscaping reduces risk of harm to residents and firefighters, and protects valuable personal and community assets.

13. Use Environmentally Preferable Materials for Non-Plant Landscape Elements and Fencing

DESCRIPTION

Fencing, hardscapes (such as planting beds, patios, walls, walkways and driveways), and other landscape elements (such as edging, benches and play equipment) present many opportunities to use durable products that reduce resource consumption, keep materials out of landfills, and provide a variety of other economic and environmental benefits.

APPLICATION

Use FSC-certified, reclaimed, rapidly renewable, finger jointed, recycled or locally manufactured products for landscape elements and fencing. Consider recycled products such as plastic or composite lumber for fencing or landscape edging (see the Exterior Finish section for more information). If recycled plastic or composite lumber is not appropriate, use Forest Stewardship Council (FSC) certified sustainably harvested wood. Salvaged materials such as broken concrete can be used to make a retaining wall or path, and tumbled glass cullet can be used to create walkways. Specify materials that are extracted, processed and manufactured within 500 miles of the project site.

BENEFIT

Environmentally preferable materials provide many benefits. Recycled plastic and composite lumber products, for example, are generally much more durable than wood because they do not rot, crack, splinter or require ongoing wood treatments. For more information about environmentally preferable materials, see the Finishes section.

14. Reduce Light Pollution

DESCRIPTION

Light pollution occurs when outdoor light fixtures cast light onto neighboring properties and into the night sky.

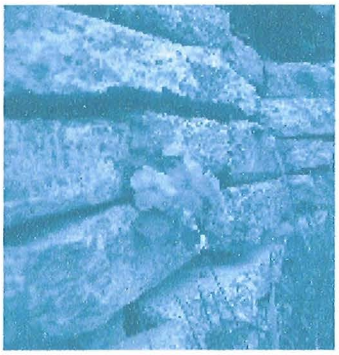
APPLICATION

Avoid outdoor lighting where it is not needed. Rather than leaving outdoor lights on all night, use lighting controls such as motion sensors, timers and photosensors so that lights are only on when and where needed. Exterior lighting that provides low contrast on critical areas, such as sidewalks and home entrances, is better for visual acuity than overlighting.

Eliminate unshielded exterior light fixtures that cast light skyward or onto neighboring properties, such as floodlights. Look for shielded fixtures certified by the International Dark-Sky Association for light pollution reduction (www.darksky.org).

BENEFIT

Reducing light pollution protects neighbors from glare and light trespass, preserves nocturnal habitats for animals, and saves energy.



Recycled concrete wall (urbanite).

D. Structural Frame and Building Envelope

1. Apply Optimal Value Engineering

DESCRIPTION

Optimal Value Engineering (OVE), also known as advanced framing, refers to techniques that reduce the amount of lumber used to build a home, while maintaining structural integrity and meeting the building code.

APPLICATION

Implement any number of common OVE techniques including framing on 24-inch centers instead of 16-inch, using headers sized for the load, using only jack and cripple studs required for the load, building two-stud corners and using drywall clips.

BENEFIT

Using OVE techniques saves wood and construction costs without a reduction in structural strength. Many OVE techniques also allow the wall to be better insulated, which improves energy efficiency and comfort.

2. Manage Construction Materials Efficiently

DESCRIPTION

Order lumber precut from the supplier and/or have structural components assembled prior to delivery. Reduce waste generated from cutting and assembly during construction.

APPLICATION

Material efficiencies can be achieved through precut and preassembled components. Framing materials including interior and exterior studs, headers, joists, beams, and posts/columns can be delivered to the jobsite precut or preassembled from the supplier. Preassembled components include prefabricated roofs, floors, walls or other systems. It also includes prefabricated building units such as modular bathrooms, bedrooms, kitchens or other rooms.

BENEFIT

Offsite cutting and assembly saves time and labor. This practice also reduces waste generated on site.

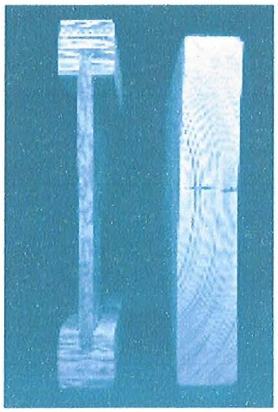
3. Use Engineered Lumber

DESCRIPTION

Solid-sawn lumber in sizes 2×10 and greater typically comes from old-growth forests or large diameter trees. Engineered lumber products, on the other hand, come from small diameter, fast-growing plantation trees. These products include glued laminated timber (glulam), laminated veneer lumber (LVL), laminated strand lumber (LSL), parallel strand lumber (PSL), wood I-joists, wood floor trusses, finger-jointed studs and oriented strand board (OSB).

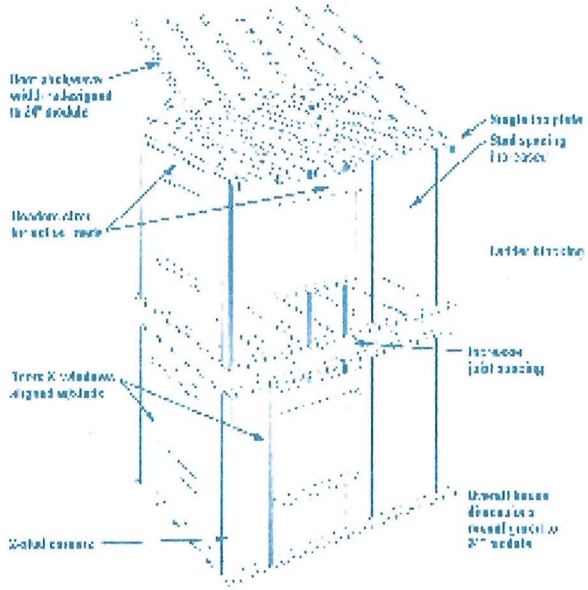
APPLICATION

Use engineered lumber instead of solid-sawn lumber wherever



I-joists use 50% less wood fiber than solid-sawn lumber.

Optimal Value Engineering Techniques



Adapted from Building Science Corporation.

applicable. Review structural building plans to make sure that engineered lumber is called out on the plans.

a. Beams and Headers

Engineered beams and headers can easily replace any solid-sawn member of similar size or larger.

b. Wood I-Joists or Web Trusses for Floors and Ceilings

The typical 2×10 and larger solid lumber used for floor joists can be replaced with engineered lumber in most applications. For floor joists use floor web trusses or I-joists instead of solid-sawn lumber. Web trusses are stronger and lighter than solid beams. I-joists have knock-outs or cavities for easier installation of ducts, pipes and wires.

c. Wood I-Joists for Roof Rafters

Use I-joists instead of solid lumber for roof rafters.

d. Engineered or Finger-Jointed Studs for Vertical Applications

Use engineered or finger-jointed studs in place of conventional studs. Finger-jointed studs use

BUILDING BASICS

ENERGY CODE COMPLIANCE

The 2008 update to California's Building Energy Efficiency Standards (commonly known as Title 24) goes into effect in January 2010. Compared to the 2005 version, the updated Standards require homes to be approximately 15 to 20% more energy efficient, depending on the climate zone.

Below are some strategies for meeting and exceeding Title 24. Keep in mind that these strategies are interrelated, not independent. When designing and building a house, it's important to understand how the building as a whole will perform, not just its individual components.

Some of the strategies listed here require field verification and testing by a certified California Home Energy Rating System (HERS) rater in order to claim credit in the Title 24 modeling. Check with your local utility company for rebate and incentive information.

a. Tighten the thermal boundary.

Identify the home's thermal boundary and seal penetrations between the conditioned spaces and unconditioned and exterior spaces. Complete this work prior to and/or during installation of the insulation. When tightening the home's thermal boundary, make sure that it is evaluated for adequate ventilation (see Building Basics article, "Mechanical Ventilation"). To receive a Title 24 credit, this strategy requires verification by a HERS rater.

b. Improve insulation.

Increased insulation in exterior walls and ceilings can reduce demand for air conditioning and heating and make homes more comfortable. However, insulation must be properly installed to minimize gaps and voids and achieve its stated value. Title 24 has a Quality Installation of Insulation (QII) credit that requires HERS verification; similar protocols are required by the U.S. EPA's Thermal Bypass Checklist. For more information, see measure J1 in these Guidelines.

c. Install radiant barrier roof sheathing in warm inland climates.

Radiant barrier roof sheathing has a reflective layer of film or foil applied to its underside. Use radiant barrier sheathing in place of, and install in the same manner as, conventional roof sheathing. Radiant barrier sheathing can reduce attic temperatures by as much as 30°F on hot days.

d. Install energy-efficient windows.

When selecting windows, look for models that have a National Fenestration Rating Council–assigned U-value of 0.4 or less. The cost premium for low-e glass is minimal and typically pays for itself very quickly. There are two types of low-e glazing: heat rejecting (soft coat) and heat receiving (hard coat). The soft coat low-e is more commonly available, and it is effective as a cooling strategy. However, the hard coat low-e is recommended for south glazing in passive solar buildings. Wood, vinyl and fiberglass frames generally insulate much better than aluminum frames.

e. Install high efficiency HVAC systems and equipment.

Once the home's thermal envelope is improved to retain conditioned air, properly sized high efficiency equipment can reduce energy use and costs and greenhouse gas emissions. Consider installing the following (see Section H of these Guidelines for more information):

1. Effective HVAC Ducting. Studies show that typically installed heating, cooling and ventilation ducts leak as much as 30% of the conditioned air into unconditioned spaces such as attics and crawl spaces. Tight ducts are given credit in Title 24 with HERS verification. Tight ducts also improve indoor air quality.
2. High Efficiency Furnace. Furnaces with an AFUE of 90% or higher cost less to operate and reduce air emissions. Furnaces with variable speed fans also use less electricity.
3. High Efficiency Air Conditioner. Air conditioning is the greaest contributor to residential peak electricity loads in California. To reduce peak demand, choose air conditioners with a SEER greater than 14 and a thermostatic expansion valve (TXV). A TXV is a refrigerant regulation device that helps ensure that the air conditioning system operates at maximum efficiency over a wide range of conditions, and can compensate for an incorrect refrigerant charge.

f. Install high efficiency water heating equipment.

A significant portion of a home's energy use goes toward heating water, particularly in climates without much need for space heating and cooling. Consider the following strategies to reduce water heating energy:

1. High Efficiency Water Heater. Water heaters with an Energy Factor (EF) greater than 0.62 heat water more efficiently and lose less energy through the flue.
2. Tankless Water Heaters. Gas-fired tankless water heaters may reduce water heating gas compared to a conventional gas water heater.
3. Solar Thermal System. Preheating domestic water with solar heated water provides considerable energy savings.
4. Pipes and Controls. Install additional pipe insulation, design for optimal pipe locations, and install recirculation controls. See Section G for more information.

short pieces of 2x4 or 2x6 material glued together to form standard stud lengths, while engineered lumber is typically veneers, strands or flakes of wood glued to form studs. These studs are all dimensionally straight and save on labor and material costs associated with culling crooked lumber and shimming and straightening crooked walls.

e. Oriented Strand Board for Subfloor

OSB is a type of engineered wood product manufactured from fast-growing plantation trees. OSB comes in sheets and is used as an alternative to plywood for subfloors.

f. Oriented Strand Board for Wall and Roof Sheathing

Use OSB as an alternative to plywood for wall and roof sheathing.

BENEFIT

Reducing demand for large dimensional lumber decreases pressure to harvest old-growth or large diameter trees. Most engineered wood products are straighter and stronger than solid-sawn equivalents, eliminating crooked walls.

4. Use Insulated Headers

DESCRIPTION

Insulated headers consist of insulation sandwiched between two wood panels or two dimensional wood components to create a larger structural member. This results in a structurally sound header that provides a thermal break.

APPLICATION

Insulated headers are a strong, cost-effective alternative to solid headers and provide a much higher insulation value than solid wood headers, which improves the home's energy efficiency. Insulated headers are lighter, straighter and more stable than headers constructed with dimensional lumber, reducing the opportunity for shrinking and warping.

BENEFIT

Insulated headers are straighter, more stable and insulate better than solid wood headers.

Construction Using SIPs

5. Use FSC-Certified Wood

DESCRIPTION

Forest Stewardship Council (FSC) certification assures that the forest from which the wood was harvested is managed in an environmentally, economically and socially responsible manner. FSC is the only lumber verification rating that maintains chain-of-custody certification throughout the cutting, milling and final delivery of products, thus ensuring that the end product originated from a certified sustainably managed forest.

APPLICATION

Use FSC-certified solid wood framing, engineered lumber, oriented strand board and plywood.

BENEFIT

FSC certification assures that forests are managed in a way that protects the long-term availability of wood resources, the health of forest ecosystems, and the sustainability of local economies.

6. Use Solid Wall Systems

DESCRIPTION

Solid wall systems are framing components that have the framing, insulation and sheathing in one convenient assembly. They include structural insulated panels (SIPs), insulated pre-cast concrete, insulated concrete forms (ICFs), autoclaved aerated concrete (AAC), and similar systems that are not constructed of wood studs.

SIPS consist of a layer of rigid foam insulation sandwiched between two sheets of composite wood such as oriented strand board. ICFs are interlocking rigid foam forms with a central cavity for poured concrete. AAC is a porous, cellular concrete that provides insulation as well as structural support, and usually comes in interlocking blocks.

APPLICATION

Each of these systems entails its own specialized installation techniques. Always follow manufacturer specifications.

BENEFIT

These walls replace wood stud construction by including structure, sheathing and insulation in a single durable, energy-efficient system. Most solid wall systems improve home comfort and save significant amounts of wood.

7. Design Energy Heels on Roof Trusses

DESCRIPTION

At the intersection of perimeter walls and the roof framing, there is often increased heat loss, because conventional roof trusses do not allow for full insulation value at the exterior wall. An energy heel is a framing technique that raises the height of the truss at exterior wall top plates to accommodate the full depth of insulation at the home's perimeter.

APPLICATION

Install where conventional trusses are used. The increased height may require modifications to exterior soffit and trim details.

BENEFIT

Energy heels on trusses allow for full insulation around the perimeter, saving energy and reducing utility bills.

8. Install Overhangs and Gutters

DESCRIPTION

Overhangs increase a home's durability by protecting it from the

elements and limiting the amount of rain striking walls. Overhangs also shade windows. Gutters provide a pathway for water to run off the roof, reducing the likelihood that water will enter walls or splash back onto the foundation and siding.

APPLICATION

Design at least a 16-inch overhang with gutters around the entire roof. Consider adding deeper overhangs where needed to shade walls and windows to provide cooling during summer. Drain gutters at least 24 inches from the home into a rainwater cistern or toward adjacent landscaped areas that are graded to receive excess water so as to recharge groundwater, filter pollutants, and water vegetation.

BENEFIT

Overhangs and gutters protect siding, windows and doors from water intrusion, thereby reducing the likelihood of rot and mold issues. Overhangs also provide protection from the sun's harsh UV rays, which can degrade building materials and furnishings.

9. Reduce Pollution Entering the Home from the Garage

DESCRIPTION

According to the U.S. Environmental Protection Agency (EPA), an attached garage is the biggest contributor to poor indoor air quality in a home. Car exhaust contains many carcinogens that can migrate into living spaces through doors and cracks in walls and ceilings adjacent to the garage. Other pollutants commonly found in garages include benzene from lawn mowers and power tools, pesticides for gardens, toxic cleaning agents, and chemicals in paints and adhesives.

APPLICATION

a. Install Separate Garage Exhaust Fan or Build a Detached Garage

Install an exhaust fan in the garage on the opposite wall from the door to the house. The fan can be triggered by an electric garage door and put on a timer to run after the door has been opened or closed.

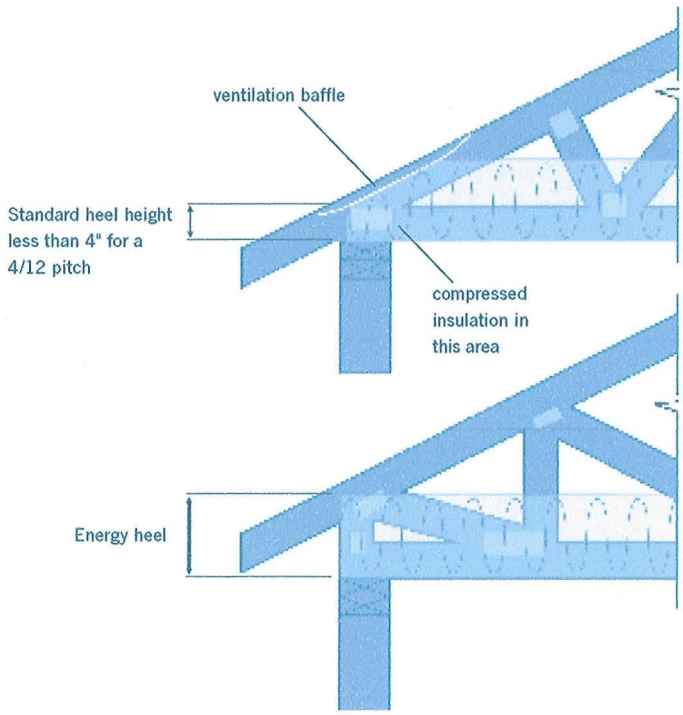
Detached garages provide the most effective means of keeping garage pollutants out of the home.

b. Tightly Seal the Air Barrier between Garage and Living Area

Use foams, weatherstripping and caulking to create an air barrier between the garage and living areas. Completely seal garage walls and ceilings adjacent to the interior. Doors should have full weatherstripping and sealed thresholds. Spray-applied foam insulation that creates a complete air barrier is recommended.

BENEFIT

Properly designed and isolated garages keep polluted air out of the home.



Energy heels on trusses allow more insulation.

E. Exterior Finish

1. Use Environmentally Preferable Materials for Decking

DESCRIPTION

Environmentally sound alternatives to conventional lumber can extend the life of decks and conserve natural resources.

APPLICATION

Use environmentally preferable material for decking. Two commonly used materials are recycled-content and FSC-certified decking.

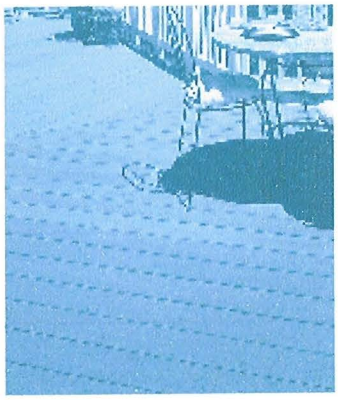
Use recycled-content decking in all nonstructural deck applications. Choose products that contain no virgin plastic. There are two types of recycled-content lumber: recycled plastic lumber, which contains only recycled plastic, and composite lumber, which combines recycled wood fiber and recycled plastic. Both can be used in place of redwood, cedar and pressure-treated lumber for the top planks and railing. These products accept screws and nails, and cut like wood. Follow the manufacturer's installation recommendations.

FSC-certified lumber comes from forests managed in an environmentally and socially responsible manner. Use FSC-certified lumber for all exterior decking applications or as structural deck members in conjunction with recycled-content decking. Choose a species of FSC-certified wood that is appropriate for exterior decking.

BENEFIT

Recycled-content plastic and composite decking materials are

Recycled-Content Decking



more durable than wood because they do not rot, crack, splinter, or require staining; also, they are not treated with toxic chemicals. Using recycled-content decking also reduces pressure to harvest forests. FSC certification guarantees that forests are managed in a way that will assure long-term availability of wood resources and forest health.

2. Specify Flashing Installation Techniques and Verify Installation

DESCRIPTION

Flashing is a thin layer of impervious material installed underneath exterior siding and roofing materials to prevent moisture from traveling through building joints. Have a third party inspect installed flashing for quality control and to ensure proper installation.

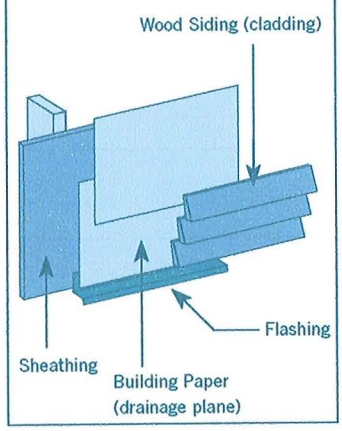
APPLICATION

Specify flashing details on the building plans for all significant exterior building material junctures, including siding, roofing, windows, doors, valleys, decks, balconies, ledgers, chimneys, and utility penetrations. Have a third party verify proper installation. A third-party inspector is an individual endorsed as a third-party inspector or risk management consultant by the residential underwriting community.

BENEFIT

Using best practices for installing flashing protects against building failures due to leaks at the roof, siding, windows, doors and other intersections and penetrations. Third-party inspection of flashing details ensures proper installation methods.

Flashing



3. Install a Rain Screen Wall System

DESCRIPTION

A rain screen wall system or ventilated drainage plane is an effective solution to external moisture penetration. It allows for an air space between the siding and wall structure, protecting the home from damaging rain intrusion.

APPLICATION

Install siding with a ⅜-in. minimum air space between the siding and the wall sheathing and vapor barrier. Flash all wall openings correctly (see measure E2) and create vent strips at the top and bottom of the wall.

BENEFIT

These techniques will provide significant protection from moisture intrusion and associated problems with rot in the wall structure. They also reduce the potential for indoor air quality problems associated with window and siding leaks, and increase the life of siding materials.

4. Use Durable and Noncombustible Siding Materials

DESCRIPTION

Sidings made of metal, stone, brick, stucco and fiber-cement offer a durable and non-combustible home exterior.

APPLICATION

Use in place of conventional wood siding.

BENEFIT

Using these siding materials can reduce repainting and other maintenance needs, protect the home from fire, and possibly lower the homeowner's insurance rates, especially in fire-prone areas.

5. Use Durable and Fire-Resistant Roofing Materials

DESCRIPTION

Forty- to fifty-year asphalt shingles, tile, slate, fiber-cement, recycled plastic and metal are examples of durable roofing materials. A Class A fire rating offers a home the highest fire protection.

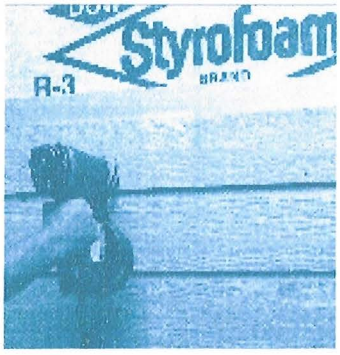
APPLICATION

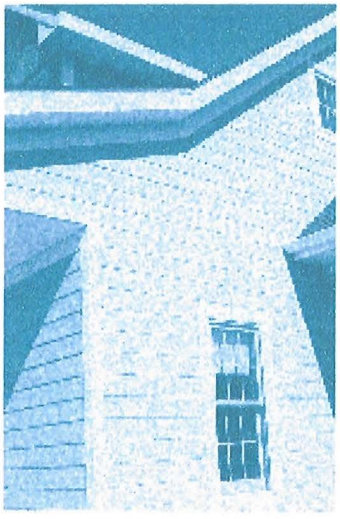
Applicable anytime roofing materials are specified. The Class A fire rating can be achieved through the roofing material itself or through the roof assembly as a whole.

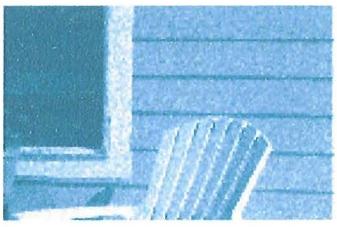
BENEFIT

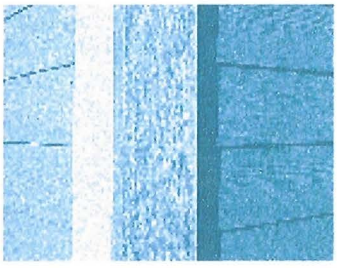
Short-lived roofing materials result in more waste going to landfills and more money spent on roof replacement. In extreme cases, early failure of a roofing material can result in water damage.

Fiber-Cement Siding









F. Insulation

1. Install Insulation with 75% Recycled Content

DESCRIPTION

Fiberglass insulation typically contains 25 to 30% recycled glass, with a combination of post-industrial and post-consumer content. Insulation made from materials such as recycled cotton or newspaper contain up to 80% post-consumer recycled materials.

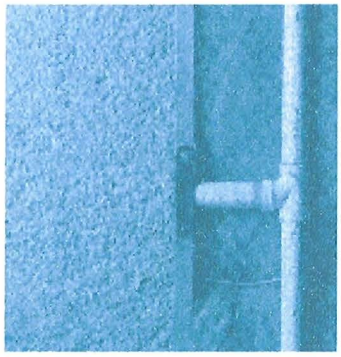
APPLICATION

Choose products with high recycled content, preferably post-consumer recycled content. Post-consumer waste is recovered after a product's useful life has ended and the product is ready to be discarded.

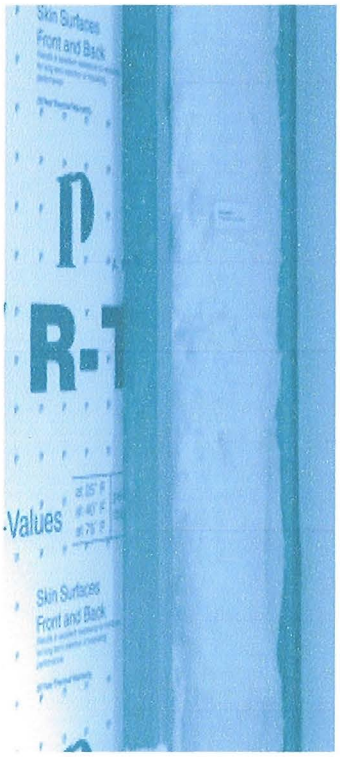
BENEFIT

Buying products with high post-consumer recycled content reduces reliance on virgin raw materials, closes the loop in the curbside recycling process, and reduces landfill deposits.

Damp-Blown Spray Cellulose Wall Insulation



Recycled-Content Batt Insulation



2. Install Low-Emitting Insulation

DESCRIPTION

Many insulation products emit formaldehyde and other volatile organic compounds (VOCs). Look for products that have been tested for low emissions by a reputable third-party organization or government agency.

APPLICATION

Select a product that has been tested for low emissions according to the California "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers." For information about this standard, go to www.ciwmb.ca.gov/GreenBuilding/Specs/Section01350.

BENEFIT

Minimizing formaldehyde and VOCs in the home improves indoor air quality.

G. Plumbing

1. Distribute Domestic Hot Water Efficiently

DESCRIPTION

Much of the energy used to heat water for domestic purposes is lost in long pipe runs from the water heater to fixtures. Locating the water heater close to usage points reduces heat loss, reduces waiting time for hot water, and most importantly, reduces water wasted down the drain while waiting for hot water to arrive at a plumbing fixture. Larger houses may require hot water circulation systems to reduce waiting time; an on-demand circulation pump is a better choice than energy-wasting continuous or timed pumps.

APPLICATION

a. Insulate All Hot Water Pipes

Reduce heat loss, send less water down the drain, and improve service by insulating all hot water pipes in the home.

b. Use Engineered Parallel Piping

Often termed home run, manifold, or parallel piping, this alternative to typical branched piping can save water and water-heating energy, if the system is well designed. Small diameter flexible pipes are run directly to the fixtures from a manifold (with branched outlets) located near the water heater. This decreases the volume of water in individual pipes and reduces friction losses and possible leaks at elbows and other fittings.

Parallel piping typically uses cross-linked polyethylene (PEX) pipe, although soft copper or CPVC could be used as well. Use PEX only where codes permit it. With low-flow fixtures, ⅜-in. diameter piping should be adequate for sinks; ½-in. piping should be used for other fixtures. Prepare an engineered piping plan to show the location and diameter of hot water pipes. This ensures that pipe efficiency is actually gained, that lengths are kept to a minimum, and that sufficient flow will be provided.

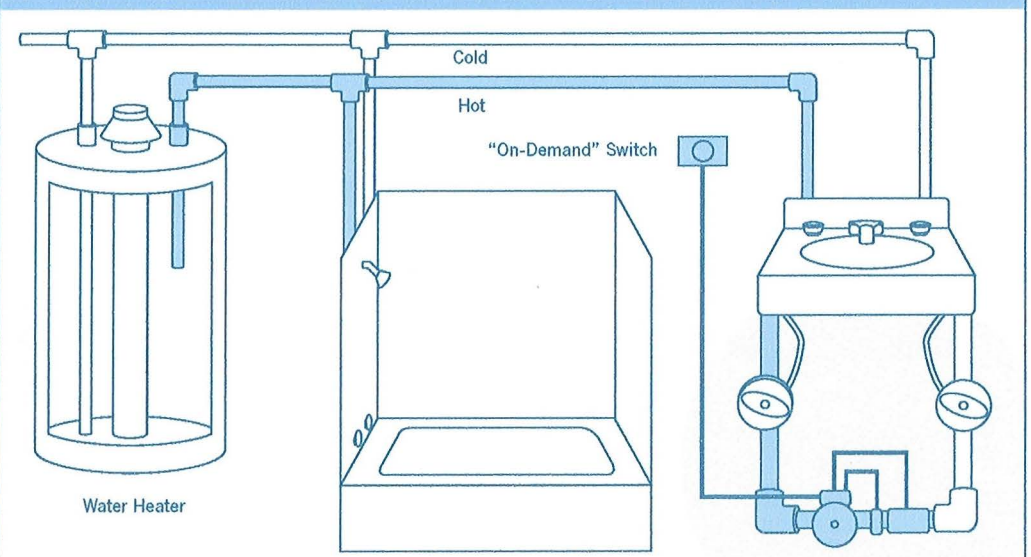
c. Use Engineered Parallel Piping with Demand-Controlled Circulation Loops

A parallel piping system can still waste water while waiting for hot water to arrive at the fixture. Each time hot water is pulled from a fixture, the plumbing system must discharge the water in the small pipe between the fixture and the manifold as well as the water in the large diameter pipe that connects the manifold to the water heater. To reduce the water loss in the large pipe, install a circulation loop between the water heater and the manifold that is run by an on-demand pump.

d. Use Structured Plumbing with Demand-Controlled Circulation Loops

In larger homes with traditional branched piping systems, another way to greatly shorten hot water

On-Demand Water Circulation Pump



delivery times is to install an on-demand hot water circulation system. These systems consist of a pump with on-demand controls (push button or motion-sensor activated) that circulate water from the existing hot water line through the cold line or via a dedicated return loop to the water heater. Only one pump is needed to supply hot water to all fixtures in the same circulation loop. On-demand hot water circulation works for all systems: tank or tankless water heaters, and copper, CPVC or PEX pipe.

The term "structured plumbing," like the term "engineered" (as used with parallel pipe systems), means that the pipe system is thoughtfully designed from the outset to optimize the circulation system's service capability.

e. Use Central Core Plumbing

The most effective means of reducing energy and water loss, as well as material use, is to locate the water heater very close to (within 15 feet in plan view) all hot water fixtures, including bathrooms, the kitchen and laundry. This can be accomplished by stacking or clustering rooms with water supplies, and creating a central core mechanical space that could house the water heater, furnace and air conditioner.

BENEFIT

Efficient design and distribution of domestic hot water saves energy, conserves water, uses less piping, and speeds hot water delivery.

2. Install Water-Efficient Faucets and Showerheads

DESCRIPTION

Conserve water and water-heating energy by installing low-water use faucets and showerheads. Faucet aerators and laminar flow devices conserve water by restricting the water flow at the faucet outlet. Aerators add air to the water stream to make the flow feel stronger. Laminar flow controls combine many parallel streams of water to produce a clear, solid-looking stream of water. Both give the feeling that water is flowing at a higher rate than it actually is.

APPLICATION

Install no more than one showerhead per shower. Choose showerheads that use less than 2 gallons per minute (gpm), bathroom faucets that use less than 1.5 gpm, and kitchen and utility faucets that use less than 2 gpm.

Water-efficient fixtures certified by WaterSense, a partnership program sponsored by the U.S. EPA, are recommended (www.epa.gov/watersense).

BENEFIT

Water-efficient fixtures lower water and water-heating energy use. They also reduce demand on the municipal water infrastructure.

3. Install Only High Efficiency Toilets

DESCRIPTION

Older toilets typically use 3.5 gallons of water per flush or more. Standard new toilets use 1.6 gallons per flush (gpf). Toilets that use less than 1.3 gpf are called high-efficiency toilets (HETs). HETs are available in dual-flush, pressure-assist and conventional gravity-flush models.

APPLICATION

In the past, some models of ultra low-flow toilets performed poorly, but thanks to design improvements the majority of today's HET toilets perform well. Install HETs that meet or exceed the performance requirements of the Maximum Performance (MaP) testing report or Uniform North American Requirements (UNAR). Download a listing of HETs, MaP reports and UNAR qualifying toilets from the California Urban Water Conservation Council (www.cuwcc.org).

Toilets certified by WaterSense, a partnership program sponsored by the U.S. EPA, are recommended (www.epa.gov/watersense).

BENEFIT

HETs perform well and allow residents to reduce their water and sewer costs. Water providers benefit from reduced demand on their water supplies and less wastewater to treat. Check with the local water utility for possible rebates.

H. Heating, Ventilation & Air Conditioning

1. Properly Design the HVAC System and Perform Diagnostic Tests

DESCRIPTION

Proper design and third-party verification of the heating, ventilation and air conditioning (HVAC) system help ensure that the system performs efficiently and keeps the occupants comfortable. The Air Conditioning Contractors of America (ACCA) has developed a set of calculation manuals—Manuals J, D and S—to determine the appropriate size and design of a home's HVAC system. Diagnostic testing of the air delivery rates completed by a third party can uncover problems and verify proper installation of systems.

APPLICATION

a. Design System

Design and install the HVAC system according to results from Manual J (the home's heat load calculation), Manual D (ductwork design and sizing) and Manual S (equipment selection and sizing).

b. Test Air Delivery

A Manual J (room-by-room) heating and cooling load analysis determines the air flow and temperature needed for comfort in each room. A flow hood diagnostic reading at each register will reveal whether the installed system meets the design goals.

Have an experienced home performance professional test each register and match the results to the design calculations. Take corrective action to repair problems and achieve the performance targets.

Also have a home performance professional test the mechanical ventilation rates to ensure they meet ASHRAE Standard 62.2, a national standard for residential indoor air quality (see the Building Basics article, "Mechanical Ventilation," in these Guidelines). Ventilation flow rates are much lower than heating/cooling flow rates. Ventilation rates are based on the number of bedrooms and the conditioned floor area of the home. Ducts should be tested to ensure that leakage is under 6%.

BENEFIT

Correctly designing and installing the HVAC system helps ensure energy savings and comfort.

2. Install Sealed-Combustion Equipment

DESCRIPTION

Conventional gas-burning furnaces and water heaters typically use indoor air for combustion. Sealed-combustion systems with direct venting, on the other hand, draw combustion air from the outdoors and pipe the exhaust directly to the outside. This reduces the risk of backdrafting, which is harmful to occupants.

APPLICATION

Install sealed-combustion units in place of conventional atmospherically vented furnaces or water heaters.

Radiant Floor Heating

BENEFIT

Sealed-combustion furnaces and water heaters improve indoor air quality and reduce the danger of carbon monoxide contamination. Another benefit is that codes allow sealed combustion furnaces and water heaters to be installed in conditioned indoor spaces, thus reducing heat loss to outdoors.

3. Install High Performance, Zoned Hydronic Radiant Heating

DESCRIPTION

Hydronic radiant heating systems heat homes by circulating hot water through underfloor tubing, wall radiators, or baseboard convectors. The hot water source can be a boiler or conventional water heater and can include a solar thermal system.

APPLICATION

Hydronic radiant heating is most appropriate in cold climates or in homes where air conditioning is not needed. Hydronic heating can also be used as an efficient solution in combination with a forced air distribution system, which might be more cost effective when a home will also have a cooling system.

Design the system in accordance with Radiant Panel Association guidelines and use an RPA-certified installer (www.radiantpanelassociation.org).

Hydronic radiant systems should be divided into zones; a good rule of thumb is one zone per 500 square feet. In order to efficiently deliver heat where it is needed, choose either variable speed pumping or zoned valving. For an efficient system, pair a radiant hydronic system with a condensing

water heater or boiler rather than an instantaneous (tankless) water heater. For greater efficiency, use outdoor reset thermostats that regulate the water heating system based on outdoor conditions.

California's Building Energy Efficiency Standards (Title 24) require slab insulation for heated slabs. If radiant hydronic heating is being used on above-ground floors, those floors should be insulated as well. For in-floor systems, it is most efficient to install radiant tubing on top of the subfloor; for joisted floors where a "staple-up" system is being used, use a heat-emitter plate to keep water temperature at or below 140°F.

Most flooring types work with hydronic radiant heating. Avoid high pile carpeting and use sponge rubber rather than dense materials for carpet padding, to allow heat transfer. Hardwood flooring will not be damaged by well-designed hydronic radiant heating, but avoid wide-plank, softwood floors.

BUILDING BASICS

MECHANICAL VENTILATION

The 2008 update to California's Building Energy Efficiency Standards (Title 24) requires new homes to have a whole house mechanical ventilation system that meets ASHRAE Standard 62.2. Prior to this update, Title 24 required mechanical ventilation only for unusually tight homes.

In a well-built house, unwanted air infiltration is minimized by pairing a tight building envelope with mechanical ventilation. Mechanical ventilation systems improve indoor air quality by using a fan to exchange indoor air for outdoor air.

An effective mechanical ventilation system:

- Removes air from rooms where moisture and odors are generated
- Delivers fresh outdoor air to frequently occupied rooms
- Runs quietly (1 sone or less) so the residents are less likely to disengage it
- Has the capacity to run continuously to maintain sufficient ventilation rates
- Has programmable controls
- Filters incoming air
- Provides tempered outdoor air
- Is easy to operate
- Is selected to address the site's climatic issues, such as high humidity or very cold winters

ASHRAE Standard 62.2 bases ventilation rates on the number of bedrooms and the conditioned floor area of the home. Single port ventilation systems, which consist of a single fan installed in one location, generally do not effectively achieve whole house ventilation. Multiport systems have multiple distribution points throughout the house, including in common areas and rooms with doors.

Ventilation systems include exhaust, supply, and balanced systems.

Exhaust ventilation systems rely on a fan to pull air out of the home. They are most effective for small tightly built homes with open floor plans. Exhaust systems, which can be either single port or multiport, do not filter incoming air and may draw air from unconditioned spaces like the attic or crawl space. Exhaust systems can depressurize a home.

Supply ventilation systems provide filtered outdoor air to the home through the HVAC system or an independent distribution system. The incoming air can be tempered or filtered prior to distribution. Because ventilation air flow rates are much lower than heating/cooling air flow rates (100 cfm for ventilation versus 1200 cfm for heating/cooling), the system must be designed to allow for ventilation at the appropriate rate when heating or cooling is not needed. A supply system will slightly pressurize a home and can minimize the potential for backdrafting of gas appliances.

Balanced ventilation systems use fans to exhaust and supply similar volumes of air. This balances the pressure of the home so that it is neither pressurized nor depressurized. To save energy, balanced ventilation systems can be equipped with heat recovery ventilation (HRV), which removes heat from exhausted air and transfers to it the incoming air. Energy recovery ventilation systems (ERV) exchange moisture as well as heat. HRVs and ERVs are most cost effective in climates with high heating or high cooling loads, and may not be economically justifiable in most California climate zones.

BENEFIT

Many people find radiant heating to be more comfortable than forced air heating. Radiant heating can provide even heat throughout a room, reduce drafts and eliminate duct leakage. Hydronic radiant heating systems can save energy when supplied by a high efficiency water heating source, such as a condensing boiler or solar water preheat system. They also eliminate fan energy use associated with forced air systems. Hydronic radiant heating systems are easily zoned, which allows residents to turn off the heat in areas of the home that aren't being used.

4. Install High Efficiency Air Conditioning with Environmentally Responsible Refrigerants

DESCRIPTION

Energy-efficient air conditioning equipment saves homeowners money and reduces demand for electricity from power plants. Environmentally sound refrigerants reduce the risk of damage to the ozone layer.

Air conditioners are rated according to Seasonal Energy Efficiency Ratio (SEER) and Energy Efficiency Ratio (EER). Higher SEER and EER ratings mean greater energy efficiency.

APPLICATION

Choose an air conditioner with a SEER of 14 or higher or an EER of 11 or higher. While these units usually cost more to buy, they are a good investment because they reduce electricity costs. Many utilities offer rebates for higher efficiency units.

Air conditioners should have a thermostatic expansion valve (TXV), which is a refrigerant regulation device that helps ensure the system operates at maximum efficiency over a wide range of conditions. Some air conditioning equipment comes with a factory installed TXV and others accept a TXV that can be installed by an HVAC contractor.

Another good strategy for energy efficiency is a zoned central air conditioning system, which allows the residents to only cool the spaces they are using and set different temperatures for those spaces.

Install AC units that don't use hydrochlorofluorocarbon (HCFC) refrigerants. HCFCs can destroy the ozone layer if the refrigerant leaks out of the air conditioner. R-22 (HCFC-22) is an HCFC refrigerant commonly used in many residential cooling systems. The Federal Clean Air Act requires that HVAC manufacturers discontinue using R-22 in new air conditioners by 2010.

Alternatives to R-22 refrigerant include R-410a, R-134a, or R-407C. Some common trade names for these refrigerants are Puron, Suva 410A, Genetron AZ-20, and Duracool.

Make sure that refrigerants are handled properly and the AC unit is properly charged. Always select a reputable dealer that employs service technicians who have been EPA certified to handle refrigerants.

BENEFIT

Air conditioning systems with high SEER/EER ratings, zoned controls, and a TXV save energy and reduce peak electricity demand. If the refrigerant leaks during replacement, a non-HCFC refrigerant will not damage the ozone layer.

5. Design and Install Effective Ductwork

DESCRIPTION

Poorly designed and installed ductwork lowers heating and cooling system efficiency and capacity, and can contribute to poor indoor air quality and comfort problems.

APPLICATION

a. Install HVAC Unit and Ductwork within Conditioned Space

Install the HVAC unit and all heating and cooling ductwork inside the home's thermal envelope. The unit and duct runs may be installed in closets, chases, and soffits purposefully designed to accommodate them, or they may be installed in an unvented attic that is insulated at the roof deck.

b. Use Duct Mastic on All Duct Joints and Seams

Leaks in the joints between ducts have been shown to allow, on average, 20 to 30% of conditioned air to leak out. Leaky air ducts can cause pressure imbalances in a home. Negative pressure in the house may draw outdoor and indoor contaminants into the home,

including carbon monoxide from gas water heaters and furnaces. Duct tape is not code approved to seal ducts; it loses its effectiveness in a few years. To maintain a tight seal for decades, use a water-based mastic at every duct joint and seam or have professionally installed aerosol sealant sprayed into the ducts.

c. Pressure Relieve the Ductwork System

When a bedroom door is closed, it reduces or cuts off the return airflow path. This restricts air movement, leading to comfort problems and a pressure imbalance, with the bedroom pressurized and the rest of the house depressurized. This may cause infiltration of contaminated air from the attic or crawl space, or backdrafting of combustion appliances. Install an additional return duct in the master bedroom and other large rooms that can be closed off with a door. Or install a jump duct or transfer grille between the hall or main living area and these rooms with doors. Provide an offset in the transfer duct to minimize sound transmission.

BENEFIT

Properly designing and installing ductwork is one of the most cost effective means to improving HVAC system performance. It reduces energy loss, minimizes indoor air quality problems and improves comfort.

6. Install High Efficiency HVAC Filters

DESCRIPTION

HVAC filters remove particulates from the air. An air filter's efficiency is rated with a Minimum Efficiency Reporting Value (MERV), a scale ranging from 1 to 20. The higher the MERV number, the more efficient the filter is at removing particles.

APPLICATION

Use HVAC air filters rated at MERV 6 to 10. These filters are recommended for cleaner air without compromising the performance of standard mechanical systems. Because filter media can restrict air flow, choose a filter designed for the HVAC system installed in the home. For example, only use a filter with a MERV greater than 10 if the HVAC system is specifically designed for it.

BENEFIT

The U.S. EPA has identified microparticulates as a leading cause of respiratory discomfort. By reducing these particles in the indoor air, a high efficiency filter protects the HVAC equipment and ensures healthier air is delivered to the living space.

7. Don't Install Fireplaces or Install Efficient Gas Fireplaces

DESCRIPTION

Gas fireplaces are installed in a large percentage of new homes mostly for decorative use. Many have efficiencies as low as 13%, yet homeowners depend on them to meet some percentage of the heating load. Though there are no U.S. or state standards regulating their efficiency, efficiency listings are required in Canada and are available for many models sold in the United States.

APPLICATION

Natural gas and propane fireplaces shall be sealed combustion (not using any indoor air for combustion) and have a permanently fixed glass front. Do not install gas fireplaces unless their listed efficiency (from Natural Resources Canada) exceeds 60%.

Note that some jurisdictions restrict the use of wood burning fireplaces or wood stoves.

BENEFIT

Efficient gas fireplaces consume less gas and reduce heating costs compared to less efficient models.

8. Install Energy Star Bathroom Fans Vented Outdoors, on Timer or Humidistat

DESCRIPTION

Excessive moisture resulting from poor ventilation is one of the main causes of mold issues and building failures. Bathrooms produce odors and a lot of moisture that can cause problems if the rooms are not properly ventilated. A fan vented to the outside and set to operate regularly will help regulate the home's indoor air quality.

APPLICATION

Choose Energy Star–qualified bathroom fans; quieter fans will have a rating of 1.5 sones or less.

Exhaust all bathroom ventilation fans to the outdoors. Bathroom fans should be controlled by a timer or humidistat to ensure proper run-time to adequately remove moisture from the room. Timers are triggered when the lights are turned on, and then run for a set time; 15 to 30 minutes usually works well. Humidistat controllers are even better, as they automatically switch on when moisture in the air reaches a threshold level, and shut down when the moisture level subsides.

If the bathroom fans serve as the home's mechanical ventilation system, be sure that they meet ASHRAE Standard 62.2 requirements (for more information see the Building Basics article, "Mechanical Ventilation," in these Guidelines).

BENEFIT

Energy Star–qualified bathroom ventilation fans have durable, high performance motors. On average, they use 65% less energy than non-Energy Star models. Bathroom fans controlled by timers or humidistats will ensure proper use and reduce moisture problems.

9. Install Mechanical Ventilation System for Cooling

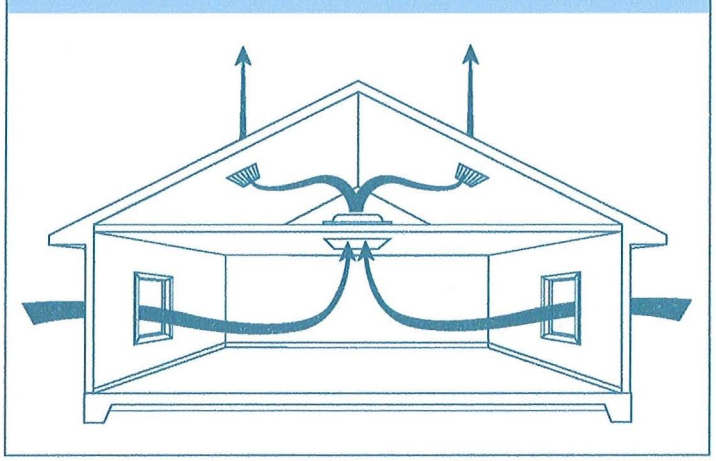
DESCRIPTION

Ceiling fans improve a home's comfort by circulating air. Energy Star–qualified models are energy efficient due to improved motors and blade designs and fluorescent lights. They can be operated to either draw warm air upward in the summer or push it downward in the winter.

Whole house fans are used as an alternative to an air conditioner to cool a house at night. They exhaust warm indoor air and bring in large volumes of cool outdoor air. However, they require open windows to admit air, and they do not filter the air.

Another option is an integrated ventilation cooling system combined with heating and cooling equipment. These are automatically controlled, do not require open windows, and deliver filtered outdoor air.

Air Flow with Whole House Fan



APPLICATION

Install Energy Star ceiling fans in areas where occupants tend to spend more time, such as bedrooms and family rooms. For fans with built-in lights, select models with Energy Star–qualified compact fluorescent light fixtures. If the fan does not include lighting, purchase an Energy Star–qualified light kit.

A whole house fan is appropriate for single-story and multistory homes. To be effective, in a multistory home it must be mounted in a hallway on the top floor. An insulated, airtight cover is necessary to prevent air leakage when the fan is not operating. Fans should be sized to produce between four to five air changes per hour and should have at least two speeds: low speed for continuous ventilation and high speed for higher cooling needs. When the fan is running, you must keep a few downstairs windows open to allow outdoor air in and to avoid backdrafting from gas appliances.

Ventilation cooling systems should be sized for four to six air changes per hour, and should have at least two speeds. Integrated ventilation cooling systems that combine with variable speed furnaces or air handlers use less fan energy and offset more air conditioning energy.

BENEFIT

Energy Star–qualified ceiling fans can make residents feel more comfortable while cutting back on their use of heating and air condi-

tioning systems and providing greater energy savings.

An average whole house fan uses one-tenth the electricity of an air conditioner. Moving large volumes of air can achieve indoor comfort at higher temperatures without air conditioning.

An integrated system can filter and condition air delivered throughout the home.

10. Install Advanced Mechanical Ventilation for Indoor Air Quality

DESCRIPTION

Mechanical ventilation improves indoor air quality by providing a controlled exchange of indoor air for less polluted outdoor air. A highly effective mechanical ventilation system should be designed to remove indoor air from rooms with moisture and odor considerations and supply outdoor air to all high use rooms.

APPLICATION

California's 2008 Building Energy Efficiency Standards (Title 24) require mechanical ventilation to meet ventilation rates based on the number of bedrooms and the conditioned floor area, as established by ASHRAE Standard 62.2. In addition to meeting these requirements, there are some best practices that will help ensure an effective system.

A good system should be continuous, quiet, and automatic to ensure it will be used. A system with a maximum of 1 sone is quiet enough that the residents will be unlikely to disengage it. Provide the homeowner with an operations and maintenance manual that clearly explains the benefits of the ventilation system and how to maintain the system for good indoor air quality.

Mechanical ventilation can be provided using an exhaust, supply or balanced system (see the Building Basics article, "Mechanical Ventilation," in these Guidelines). Not all ventilation systems are whole house systems. A balanced whole house distribution system delivers fresh air to high occupancy areas like bedrooms and living rooms rather than exhausting or supplying air from one point. A balanced whole house system also yields a higher rate of air exchange.

Distribution systems with a fan rated to operate at a continuous or intermittent low rate are more efficient and effective at delivering the appropriate amount of ventilation air than systems that operate at a higher rate but less frequently.

Building ventilation should be addressed in conjunction with building tightness to reduce unwanted infiltration of outside air, improve building performance and increase comfort. Ventilation rates should be tested to verify performance (see measure H1).

BENEFIT

Mechanical ventilation systems reduce moisture and dilute indoor air pollution by providing fresh outdoor air. Balanced systems introduce fresh air into the home while reducing energy loss by capturing heat from the exhausted air stream and transferring it to the incoming air.

11. Install Carbon Monoxide Alarm

DESCRIPTION

Carbon monoxide (CO) is emitted from fuel-burning appliances such as stoves, cooktops, water heaters, furnaces and fireplaces, as well as from cars and some landscape equipment. If a home is tightly built for energy efficiency but has leaky HVAC ducts, the air leaks may depressurize the home and reverse the flow of exhaust from vent pipes. This can introduce carbon monoxide from fuel-burning appliances back into the home, a process known as backdrafting. Also, fuel-burning appliances that are burning inefficiently can contribute carbon monoxide to the living space.

APPLICATION

Install a carbon monoxide alarm per manufacturer's instructions. Alarms must comply with UL 2034 and/or CSA 6.19 standards. Alarms must be replaced every three to five years, as they lose their sensitivity over time.

BENEFIT

A carbon monoxide alarm provides an added level of home safety.

I. Renewable Energy

1. Pre-Plumb for Future Solar Water Heating Installation

DESCRIPTION

Preparing for the installation of solar water heating (also known as solar thermal systems) will reduce the cost of future installation and adds little cost at the time of construction.

APPLICATION

Installing insulated pipes and sensor wiring between the attic and the water heater location will facilitate future installation of a solar water heating system. To accommodate "active" systems, provisions should be made for a water storage tank (with pressure relief drain line) and an electrical outlet for a pump. Provide at least an 8 ft. by 8 ft. clear section of south-facing roof for future installation of the solar collectors.

BENEFIT

Pre-plumbing for solar hot water will make it easier and less expensive to install a solar water heating system in the future.

2. Install Wiring Conduit for Future Photovoltaic (PV) Installation

DESCRIPTION

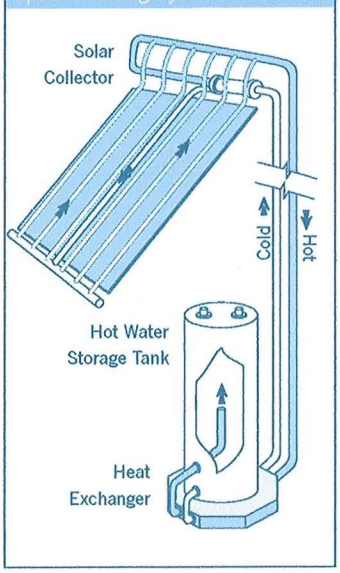
Making provisions during construction for installing future solar electric systems (also known as photovoltaic or PV systems) can lower the cost when systems are installed later.

APPLICATION

Maintain a 200-square-foot or larger section of south or west roof area clear of vent pipes and other obstructions to allow for the installation of modules. Install ¾-inch or larger conduit with pull boxes as needed to run wire from the attic to a junction box near the main panel and meter. Provide the owner with a roof plan with the preferred location for PV modules and the conduit location clearly marked, and provide structural information on what added loads the roof can accommodate.

Installing Solar Water System

Solar Hot Water and Space Heating System



BENEFIT

Planning ahead for solar electricity will make it easier and less expensive to install a photovoltaic system in the future.

3. Offset Energy Consumption with PV, Solar Thermal or Wind Energy

DESCRIPTION

Renewable energy technologies, including photovoltaic systems, solar thermal systems and wind turbines, can be installed on site to offset energy consumption. Federal tax credits and state and local incentives are available for some types of renewable energy systems.

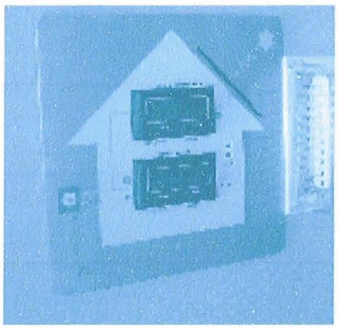
APPLICATION

Photovoltaics

PV systems convert solar energy into electricity. Most residential systems are grid connected. If the PV system generates more power than the home uses, additional electricity is fed back into the utility grid. This effectively spins the home's electricity meter backward in what is known as net metering. When the home requires more electricity than is generated by the PV system, the home draws power from the grid.

Adding battery back-up to the PV system is expensive but allows the homeowner to keep some electrical systems running during power outages; batteries are also used with off-the-grid systems.

The best location for PV modules is on south or west-facing roofs. South-facing modules produce more energy annually, but west-facing modules can take better advantage of time-of-use rates that



Power meter showing the amount of solar electricity generated and used.

are available from some utilities, and help reduce the electricity grid's peak load.

Solar Thermal

Solar water heating systems use solar collectors and a water storage tank to provide hot water for domestic use and/or space heating. Solar water heating systems are typically used to deliver preheated water to a water heater. Solar water heating is more cost effective than ever, as a result of new technologies, reliable products, and rising energy prices.

Use only solar water heaters certified by the Solar Rating and Certification Corporation (SRCC). Ensure that there is sufficient south-facing roof area for collectors, that the roof structure will accommodate the system's weight, and that there is adequate area near the water heater for additional mechanical equipment such as storage tanks, pumps, pipes and controllers.

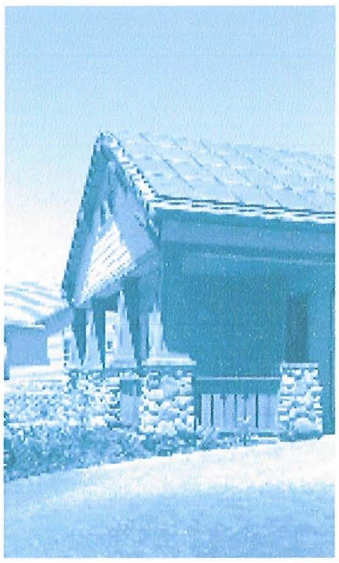
Wind Turbines

Wind energy can be converted into electricity through the use of an onsite wind turbine. The wind turns two or three turbine blades around a rotor, which is connected to a shaft and spins a generator. The generator converts mechanical power (which the wind turbine converted from kinetic wind energy) into electricity.

Residential wind turbines can make sense in areas with average annual wind speeds of at least 10 miles per hour. To determine wind speeds for an area, go to www.windpoweringamerica.gov/wind_maps.asp.

Wind power, though intermittent, can help reduce electricity costs for grid-connected homes. For homes on remote sites, the cost of installing a wind turbine may be less than the cost of running a power line from the grid. As electricity costs increase, wind energy may be increasingly cost competitive with grid energy.

Photovoltaic System, Centex Homes, Livermore, CA



BENEFIT

Onsite renewable energy systems reduce transmission losses, peak electricity demand and reliance on the grid system, which may reduce the need to build new power plants and improve national energy security. These systems offset the homeowner's utility costs and don't produce greenhouse gases and other air pollutants.

J. Building Performance

1. Perform Building Envelope Diagnostic Evaluations

DESCRIPTION

Homes designed to be very energy efficient may still perform poorly if the building envelope components are not installed properly. Diagnostic evaluations and inspections can help uncover errors and fix potential problems.

APPLICATION

Test the thermal envelope's effectiveness. Inspection and diagnostic evaluations should include Quality Insulation Installation (QII) and Thermal Bypass Checklist protocols, as well as tests for air infiltration and combustion safety backdrafting.

Studies show that poorly installed insulation severely decreases the material's insulating value. Use best practices to air seal and insulate the home's thermal envelope. Consider installing insulation above the minimum levels required by California's Building Energy Efficiency Standards (Title 24).

Pay proper attention to installation detail and quality assurance. Install insulation with no gaps or voids. Insulation should fill the cavity side-to-side, top-to-bottom and front-to-back and be cut to fit around wiring and plumbing without compression. Compared to batts, blown-in fiberglass, blown-in cellulose or medium density closed cell spray-foam insulation typically do a much better job of filling gaps and sealing around pipes. Don't be tempted to skip the insulation of cavities that are difficult to access.

Title 24 offers a compliance credit for QII if inspected by a certified Home Energy Rating System (HERS) rater (for more information see the Building Basics article, "Energy Code Compliance," in these Guidelines). Additional energy efficiency and improved comfort can be achieved by meeting Energy Star Qualified Homes for California criteria, which includes the QII protocol and the Thermal Bypass Checklist. Thermal Bypass practices encompass measures to ensure a continuous thermal envelope to prevent air and heat transfer, practices that are not addressed by the QII protocol.

Use a blower door test to estimate the interior natural air changes per hour (NACH) for the whole house. The NACH should be close to or less than 0.35; if it isn't, make any necessary improvements to meet this threshold and test again.

Perform a combustion safety backdraft test if needed to ensure carbon monoxide is not backdrafting into the home from an open-combustion fireplace, water heater or furnace.

BENEFIT

Third-party home performance testing is vital to ensure that homes perform as intended. Effectively installed insulation creates a more comfortable home and reduces the owner's utility costs.

2. Design and Build Energy-Efficient Homes

DESCRIPTION

California's Building Energy Efficiency Standards (Title 24) set energy efficiency requirements for residential and nonresidential construction. Title 24 merely establishes minimum standards required by law; green homes are designed and built to exceed Title 24 requirements. For more information, see the Building Basics article, "Energy Code Compliance," in these Guidelines.

APPLICATION

Identify opportunities where exceeding Title 24 will be cost effective or will provide other significant benefits, such as improved comfort, indoor air quality or durability. Homes whose energy performance exceeds Title 24 by at least 15% due to more efficient space heating and cooling or water heating may be eligible for the Energy Star label. Energy Star has additional requirements that address Quality Installation of Insulation (QII) and duct leakage.

BENEFIT

Homes built to exceed Title 24 requirements may be more comfortable, have lower energy costs, and have higher quality construction than homes that merely meet code.

3. Design and Build Near Zero Energy Homes

DESCRIPTION

In a near zero energy home, the amount of energy produced onsite is approximately equal to the amount of energy needed on an annual basis. This is achieved through a combination of passive solar and energy-efficient design, onsite renewable energy generation, and the residents' energy conservation practices.

APPLICATION

To achieve a near zero energy home, minimize the building's energy consumption as much as possible, and then supply the remaining demand for energy through onsite renewable systems. These are the basic strategies:

1. Utilize passive design strategies, including orientation for solar gain, shading, thermal mass and natural cross-ventilation.
2. Optimize the performance of the building envelope; specify insulation with appropriate R-values and windows with appropriate U-values and solar heat gain coefficients (SHGC).
3. Select high efficiency appliances. Make sure mechanical systems (HVAC and water heating) are well designed and tested for performance.
4. Encourage the homeowners to reduce their energy use by installing control and monitoring systems.
5. Use renewable energy sources like PV, solar thermal and wind power to produce the remainder of energy needed.

The measures in these Guidelines address specific strategies that can result in a near zero energy home. For additional guidance, refer to the U.S. Department of Energy's Building America standards (www.eere.energy.gov/buildings/building_america) or the Passive House Institute US program (www.passivehouse.us).

BENEFIT

Compared to homes that merely meet Title 24 requirements, near zero energy homes result in fewer greenhouse gas emissions, less energy consumption and lower utility bills.

4. Obtain EPA's Indoor airPLUS Certification

DESCRIPTION

The U.S. Environmental Protection Agency's Indoor airPLUS program provides specifications for constructing a home with improved indoor air quality. The Indoor airPLUS program requires a tightened thermal envelope, balanced air pressure, fresh air, pest control measures, and reduction of indoor contaminants; it also addresses all major moisture issues. The program is designed to be complementary with the Energy Star New Home program.

APPLICATION

Only Energy Star–qualified homes are eligible for the Indoor airPLUS label. To earn the Energy Star, a home must exceed Title 24 by at least 15% and meet HERS diagnostic performance tests for reduced duct leakage, right-sizing of air conditioning, and the QII/Thermal Bypass Checklist protocols. Utility incentives may be available to help offset the cost of high efficiency equipment and home performance testing.

To earn the Indoor airPLUS label, the home must meet and fulfill all the requirements on the program's checklist and have the measures verified. For more information, visit www.epa.gov/indoorairplus.

BENEFIT

Energy Star–qualified new homes provide greater comfort, durability and energy savings for the homeowner, and reduce greenhouse gas emissions. New homes that qualify for the EPA's Indoor airPLUS program provide a healthier indoor environment. Building professionals can differentiate themselves by marketing their homes with these two labels.

5. Use a CABEC Certified Professional for Title 24 Documentation

DESCRIPTION

Title 24 analysts who complete code compliance documentation for building permit applications are not required to be certified, so the

quality of modeling done for Title 24 compliance is variable. The California Association of Building Energy Consultants (CABEC) has created Certified Energy Plans Examiner (CEPE) and Certified Energy Analyst (CEA) certifications to differentiate Title 24 analysts who have demonstrated knowledge and experience with the code.

APPLICATION

Choose a CEPE or CEA to prepare the Title 24 compliance documents.

BENEFIT

A CEPE or CEA may model the building more accurately than an uncertified Title 24 analyst. The CEPE or CEA may be able to recommend alternative technologies or strategies for the most cost-effective approach to compliance.

6. Participate in Utility Program with Third-Party Plan Review

DESCRIPTION

While energy-efficient building equipment and renewable energy systems save money in the long run, they can be expensive to purchase. Many utilities offer incentives to help builders afford energy-efficient equipment, onsite renewable energy systems, and other energy efficiency measures. Programs such as the New Solar Homes Partnership (NSHP) encourage comprehensive whole building performance that combines high levels of energy efficiency and solar energy systems.

APPLICATION

Participate in an energy efficiency incentive program or a renewable energy program with a third-party plan review offered by your local utility. Pacific Gas & Electric Company, Southern California Edison and San Diego Gas & Electric Company offer the NSHP program in their service areas. Similar programs are offered by local publicly owned utilities.

BENEFIT

Developers and homeowners benefit from the technical assistance provided by these programs and by the reduced upfront cost of purchasing higher efficiency equipment and building components. These programs also require a third-party plan review of California's Building Energy Efficiency Standards (Title 24) documentation and solar installation design, which results in more accurate energy savings estimations and real-life energy savings.

K. Finishes

1. Design Entryways to Reduce Tracked-In Contaminants

DESCRIPTION

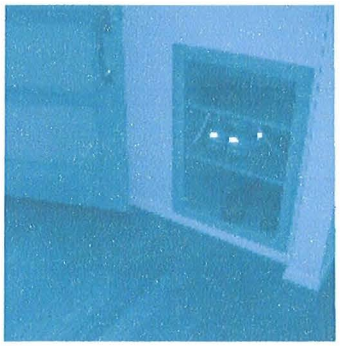
Up to two-thirds of dust and particulates in homes are tracked in on shoes. These tracked-in particulates contaminate the home with everything from soil and pesticides to abrasive sand, mold, road grime and bacteria.

APPLICATION

The most effective way to avoid tracking contaminants into the home is for people to remove their shoes upon entering. Provide features near entryways that encourage the removal and storage of shoes and outerwear, such as benches or a mudroom. For entryways, avoid carpet, and choose easily cleaned flooring with a hard surface, such as hardwood, bamboo, concrete, ceramic tile or natural linoleum.

BENEFIT

The home will be cleaner, with less dirt and other pollution tracked in.



Shoe Storage Near Entryway.

2. Use Low-VOC or Zero-VOC Paint

DESCRIPTION

Most interior paints contain volatile organic compounds (VOCs), a major class of indoor and outdoor air pollutants. Besides affecting indoor air quality, certain VOCs react with other chemicals in the atmosphere, producing ground-level ozone (smog) that can affect human health. Low- and zero-VOC paints reduce these sources of pollution.

APPLICATION

Interior paints with low or zero levels of VOCs are available from most major manufacturers and are applied and perform like conventional paint. According to South Coast Air Quality Management District thresholds, low-VOC paints contain less than 50 grams per liter (gpl) of VOCs for both flat and nonflat finishes. Paints that contain less than 5 gpl of VOCs are classified as zero VOC.

BENEFIT

Low- or zero-VOC paint reduces the emissions of VOCs, improving indoor air quality and reducing smog.

3. Use Low-VOC Wood Finishes

DESCRIPTION

Conventional petroleum-based wood finishes can offgas for months and can be particularly harmful to children and chemically sensitive individuals. Offgassing means the solvents in the product are released into the air, contaminating indoor air quality. Low-VOC finishes, such as waterborne urethane and acrylic or plant-based oils, are lower in toxic compounds compared to conventional oil-based finishes and provide similar durability.

APPLICATION

Use wood finishes, stains or coatings with less than 250 grams per liter of VOCs. For specific types of coatings, use the VOC limit set by the South Coast Air Quality Management District's Rule 1113 (www.aqmd.gov/rules/reg/reg11/r1113.pdf). If oil-based wood finishes must be used, apply them offsite or allow them to offgas completely (three to four weeks) prior to occupancy.

BENEFIT

Using low-VOC wood finishes reduces offgassing, improves indoor air quality and reduces smog.

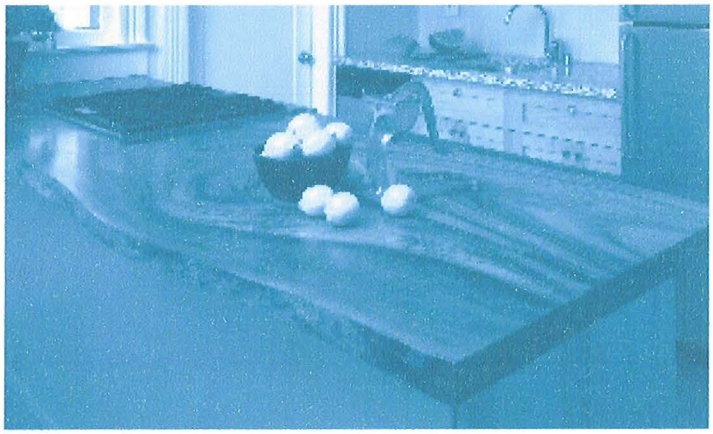
4. Use Low-VOC Caulk and Construction Adhesives

DESCRIPTION

Unlike conventional caulks and construction adhesives that may offgas toxic compounds for months, low-VOC products reduce toxic gases such as aromatic hydrocarbons or other petroleum solvents that contribute to indoor and outdoor air pollution.

APPLICATION

Use caulks and adhesives with VOC concentrations of less than 70 grams per liter in place of standard caulks and adhesives for all interior applications such as



Salvaged wood countertop.

installation of framing, subfloors, finish flooring, countertops, trim, wall coverings, paneling and tub/shower enclosures. Or use the appropriate VOC standard for the specific product according to the South Coast Air Quality Management District (SCAQMD) Rule 1168 (2005 amendments version) standards (www.aqmd.gov/rules/reg/reg11/r1168.pdf).

BENEFIT

Low-VOC caulks and adhesives work as well as or better than conventional products, emit fewer pollutants and reduce the risk of potentially harmful health impacts.

5. Use Recycled-Content Paint

DESCRIPTION

A number of manufacturers have developed high quality recycled-content latex paint and primers. The recycled portion (ranging from 20 to 100%) comes from unused consumer or industrial stock, as well as paint recovered from household hazardous waste collection facilities. The paint is checked for quality and then sent to paint manufacturers for recycling and blending with new paint.

APPLICATION

Latex paint with recycled content is applied like conventional paint. Due to the blended nature of the paint, it tends to come in a limited range of colors. Look for products that are certified by Green Seal to meet quality, performance, safety and environmental standards

BENEFIT

Recycled paint is often less expensive than new paint. It also reduces the need to manufacture new paint and supplies a market for unused paint, rather than putting it into the waste stream.

Recycled glass and concrete bathroom counter.

6. Use Environmentally Preferable Materials for Interior Finish

Environmentally preferable options for interior finishes include materials that are FSC-certified, are reclaimed or refinished, are rapidly renewable, contain recycled-content, are finger-jointed, or are locally sourced and manufactured.

a. Use FSC-Certified Materials

DESCRIPTION

Forest Stewardship Council (FSC)–certified wood comes from forests managed in accordance with stringent sustainable forestry practices, including a complete chain of custody tracking system and third-party verification.

APPLICATION

Use FSC-certified wood and wood products in any application that normally calls for conventional plywood or solid wood materials, such as cabinets, trim, doors, shelving and window frames.

BENEFIT

FSC certification assures that forests are managed in a way that protects the long-term availability of wood resources and the health of forest ecosystems and local economies.

b. Use Reclaimed Materials

DESCRIPTION

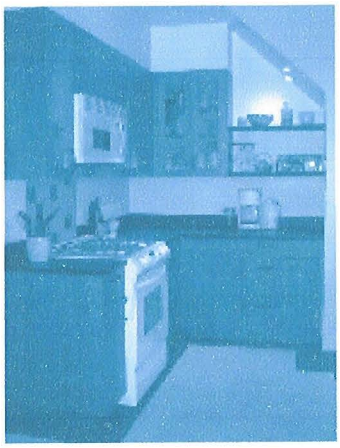
High quality finish materials, including dimensional lumber, can often be salvaged from other buildings that are being deconstructed or sourced from a reclaimed material distributor.

APPLICATION

Use reclaimed material instead of new material. Commonly used salvaged products include reclaimed lumber for nonstructural applications, such as mantles, nonstructural beams, casing, trim, cabinets, doors and wood flooring. Reclaimed lumber may be used for structural applications if it has been re-graded and engineered for such purpose. Also look for sinks, tubs, electrical products and fixtures, and roofing materials.

BENEFIT

Reclaimed materials reduce resource consumption and landfill deposits. Reclaimed lumber and many other salvaged materials are often of higher quality than new products.



FSC-certified cabinets, countertop made from wood fibers harvested from sustainable forests and linoleum flooring.

c. Use Rapidly Renewable Materials

DESCRIPTION

Rapidly renewable materials are made from agricultural crops that grow quickly and can be harvested on a relatively short cycle compared to slower-growing wood. Rapidly renewable resources can be defined as plants that grow to harvestable size in 10 years or less. Examples include bamboo, a fast-growing grass that can be harvested in three to five years, and straw, the stalk of wheat, rice, barley and other grains.

APPLICATION

Instead of using solid wood, plywood, wood-based medium density fiberboard (MDF) or particleboard for interior finishes, consider rapidly renewable materials such as straw-based MDF and bamboo plywood.

BENEFIT

Rapidly renewable materials are attractive, durable and reduce pressure to harvest forests that have a slower growth cycle. Properly seasoned bamboo is as durable as most hardwoods.

d. Use Recycled-Content Materials

DESCRIPTION

Some recycled-content interior finishes, such as molding or other decorative components, are made from recycled polystyrene or other plastics. Recycled-content countertops include recycled glass tiles, terrazzo-like materials that blend recycled glass and concrete and natural fiber composites derived from rapidly renewable or recycled

resources. Recycled-content products are available for kitchen and bathroom applications such as countertops, backsplashes, shower walls and vanity tops.

APPLICATION

Choose products with high recycled content, preferably post-consumer recycled content.

Use recycled-content finish materials in any application where virgin materials are typically used.

BENEFIT

Recycled-content products reduce demand for virgin materials and keep valuable resources out of the waste stream.

e. Use Finger-Jointed Materials

DESCRIPTION

Finger-jointed trim, studs and fascia are manufactured from short pieces of wood glued together to create a finished material.

APPLICATION

Use finger-jointed materials in any application where it can replace solid lumber and where materials are to be painted.

BENEFIT

Finger-jointed elements are straighter and more stable than conventional wood, and use wood more efficiently, reducing the waste stream and using less larger-diameter lumber.

f. Use Locally Sourced and Manufactured Materials

DESCRIPTION

Choose materials that have been extracted, processed and manufactured within a 500-mile radius of the project site.

APPLICATION

Specify materials that are produced locally. In California, options include FSC-certified wood, ceramic tiles, and some recycled-content materials.

BENEFIT

Using locally extracted, processed, and manufactured materials reduces transportation costs and associated fossil fuel use and pollution. Locally sourced materials also promote local economic development, and heightened community awareness of the environmental impacts of materials sourcing.

7. Reduce Formaldehyde in Interior Finishes

DESCRIPTION

Formaldehyde is carcinogenic. Formaldehyde is often used as a binder in home-building products such as plywood, particleboard and other composite wood products. These binders come in two basic forms: urea and phenol. Urea-formaldehyde binders are common in interior-grade products. Phenol-formaldehyde binders are used in exterior applications because they are more water resistant. This water resistance quality makes phenolic glues offgas more slowly and in lower quantities than urea glues, reducing some of the harmful effects on indoor air quality.

APPLICATION

Whenever possible, use interior materials (including subfloor and stair treads, cabinets and countertops, interior trim and shelving) that emit little or no formaldehyde. Select materials that have been tested for low emissions according to the California "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers." (For information, go to www.ciwmb.ca.gov/GreenBuilding/Specs/Section01350.)

BENEFIT

Reducing formaldehyde exposure helps protect the health of residents, particularly children and other people who are more affected by indoor air pollution.

L. Flooring

1. Use Environmentally Preferable Flooring

Environmentally preferable flooring options include FSC-certified wood, reclaimed, rapidly renewable or recycled-content materials, exposed concrete slabs, and local materials.

a. Use Forest Stewardship Council (FSC)–Certified Wood Flooring

DESCRIPTION

FSC-certified wood flooring comes from forests managed in an environmentally, economically and socially responsible manner. FSC is the only wood verification rating system that maintains chain-of-custody certification throughout the cutting, milling and final delivery of products, thus ensuring that the end product originated from a certified sustainably managed forest. FSC-certified products are available in a wide variety of domestic and exotic species.

APPLICATION

Use FSC-certified hardwood in place of conventional hardwood flooring.

BENEFIT

FSC certification assures that forests are managed in a way that protects the long-term availability of wood resources, the health of forest ecosystems, and the sustainability of local economies.

b. Use Reclaimed Flooring Materials

DESCRIPTION

High quality salvaged wood flooring or other salvaged flooring products can often be reclaimed from deconstructed or remodeled buildings.

APPLICATION

Use low-VOC sealers when refinishing reclaimed wood floors. Find salvaged flooring from building materials reuse stores or through online resources such as Craigslist.org and Freecycle.org. The California Integrated Waste Management Board (www.ciwmb.ca.gov) also provides information about material reuse.

BENEFIT

Reclaimed building materials reduce resource consumption and landfill deposits. Many salvaged products are of higher quality than new materials.

c. Use Rapidly Renewable Flooring Materials

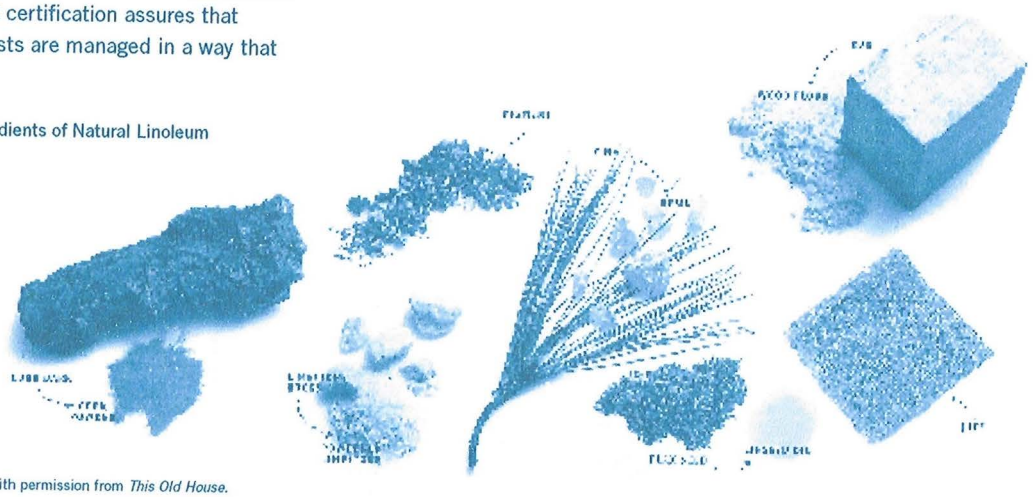
DESCRIPTION

Bamboo, cork and natural linoleum flooring are alternatives to conventional hardwood, carpet or vinyl flooring. Properly seasoned bamboo, which is as durable as most hardwoods used for floors, is a fast-growing grass that can be harvested in three to five years. Cork is harvested from the outer bark of the cork oak tree; the tree regenerates its bark within 10 to 15 years. Natural linoleum is manufactured primarily from renewable materials such as cork, jute, wood flour and linseed oil.

APPLICATION

Use these rapidly renewable flooring materials in place of

Ingredients of Natural Linoleum



Used with permission from *This Old House.*

Bamboo Flooring and Recycled-Content Carpet

conventional hardwood, carpet or vinyl flooring.

Cork can also be used as an underlayment for hard-surfaced flooring to reduce impact noise between rooms.

BENEFIT

Rapidly renewable flooring materials reduce pressure to harvest forests. Cork and linoleum are naturally fire- and moisture-resistant as well as sound absorbent.

d. Use Recycled-Content Flooring

DESCRIPTION

Flooring can be made from a variety of recycled materials. Recycled-content ceramic tiles can contain up to 70% recycled glass or other materials. Recycled-content carpet is made from recycled plastic bottles, recycled nylon and wool, or recycled cotton.

APPLICATION

Install recycled-content tiles wherever conventional tiles are specified. Recycled-content carpet can be used in all applications where conventional carpet is specified, and is comparable in appearance, performance and price to conventional synthetic carpet made from virgin materials.

BENEFIT

Recycled-content products keep valuable resources out of the waste stream. Each square yard of recycled-content carpet uses approximately 40 two-liter soda bottles.

e. Use Exposed Concrete as Finished Floor

DESCRIPTION

With slab-on-grade construction, the concrete can be polished, scored with joints in various patterns, or stained with pigments to create a finished floor. This approach is especially appropriate for use with in-floor radiant heating systems and passive solar design.

APPLICATION

Use this approach for slab-on-grade construction. The finish must be designed and constructed when the slab is being poured, and well protected throughout construction.

BENEFIT

Using the slab as a finished floor eliminates the need to use other flooring materials, reducing overall material demand. It is also durable and easy to clean.

f. Locally Sourced and Manufactured Flooring Materials

DESCRIPTION

Choose materials that have been extracted, processed and manufactured within a 500-mile radius of the project site.

APPLICATION

Specify flooring that is locally sourced, such as wood grown within 500 miles.

BENEFIT

Using locally extracted, processed, and manufactured materials reduces transportation costs and associated fossil fuel use and pollution. Locally sourced materials also promote local economic development, and heightened community awareness of the environmental impacts of materials sourcing.

2. Increase Thermal Mass of Floors

DESCRIPTION

Flooring materials like concrete can improve thermal mass for passive cooling and heating.

APPLICATION

Low-cost thermal mass includes using hard flooring such as tile and finished concrete slabs. Wood flooring over a concrete slab also provides reasonably good thermal mass.

BENEFIT

Increasing thermal mass will reduce heating and cooling energy use and will moderate indoor temperature swings, keeping the home more comfortable.

3. Use Low-Emitting Flooring

DESCRIPTION

Flooring products may emit formaldehyde and other volatile organic compounds. To protect indoor air quality, look for products that have been tested and approved for low-emissions by a reputable third-party or government organization.

APPLICATION

Choose carpet that meets or exceeds the CRI Green Label Plus requirements (www.carpet-rug.org). Choose flooring products that are FloorScore Certified (www.rfci.com/int_FloorScore.htm) or that have been tested for low emissions according to the California "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers" (www.ciwmb.ca.gov/GreenBuilding/Specs/Section01350).

BENEFIT

Minimizing formaldehyde and volatile organic compounds in the home improves indoor air quality.

Concrete floor.

M. Appliances and Lighting

1. Install Energy Star Dishwashers

DESCRIPTION

Energy Star–qualified dishwashers reduce energy use by at least 41% compared to the federal minimum standards. Some dishwashers are more water-efficient than others, even among Energy Star–qualified models. As of August 2009, Energy Star is changing its requirements to not only address energy efficiency but also water use. To meet the new Energy Star requirements, a standard-sized dishwasher can use no more than 324 kilowatt-hours per year and no more than 5.8 gallons per cycle.

APPLICATION

Select water- and energy-efficient dishwashers that use an internal water heater to boost temperatures inside the dishwasher. This means that household water heaters can be turned down to 120°F, saving water-heating costs. Find Energy Star–qualified models at www.energystar.gov.

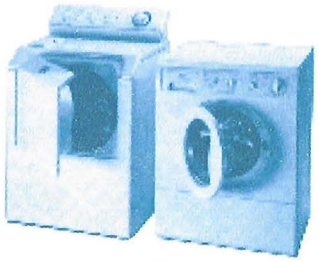
BENEFIT

High efficiency dishwashers reduce water and energy use.

2. Install Energy Star Clothes Washers with Water Factor of 6.0 or less

DESCRIPTION

Energy Star–qualified clothes washing machines use 50% less energy and 45 to 60% less water while performing as well as a standard washer.



Horizontal axis washing machines.

APPLICATION

Choose models with a water factor rating of 6.0 or less and a modified energy factor of 2.0 or greater. Note that not all Energy Star models meet this level of water and energy efficiency.

Most Energy Star washing machines save energy and water through a front-loading design (horizontal axis) that tumbles clothes in a small amount of water. Most models also include a high-speed final spin cycle that extracts more moisture than standard washers. Less moisture means less drying time, which saves additional energy. Find qualifying models at www.energystar.gov or www.cee1.org.

BENEFIT

Energy Star–qualified washing machines use substantially less water and energy than conventional washers.

3. Install Energy Star Refrigerators

DESCRIPTION

Refrigerators and freezers are among the largest users of electricity in most homes. They can account for up to 25% of household energy use. Energy Star refrigerators save at least 10% over the federal minimum standards.

APPLICATION

Select an Energy Star–qualified refrigerator that has less than 25 cubic feet of capacity (refrigerator and freezer). For a list of qualifying models, visit www.energystar.gov.

BENEFIT

Energy Star refrigerators can reduce the total annual electricity bill by more than 10%. Choosing a model no larger than 25 cubic feet will further reduce electricity costs.

4. Install Built-In Recycling and Composting Centers

DESCRIPTION

Built-in recycling and composting centers provide bins for separated recyclables, compostables and trash.

APPLICATION

Install a built-in recycling area in the kitchen's base cabinets. Some waste haulers allow recyclables to be mixed, while others require

Built-in recycling center.

that glass, paper, plastic or other materials be separated. Check local requirements and design the built-in recycling area accordingly.

Design a kitchen compost bin that is protected from pests and is odor-resistant. Food scraps can be added to a backyard compost pile or bin. Some cities collect food scraps via a curbside food recycling program and provide a designated food scraps bin.

BENEFIT

Recycling and composting reduce the amount of material entering landfills and can save money for homeowners through reduced disposal fees (many waste haulers charge a lower fee for smaller garbage bins). Composting creates high quality soil amendments useful in gardens.

5. Install High Efficacy Lighting

DESCRIPTION

Lighting efficacy refers to the amount of light (typically measured in lumens) produced per watt of power used. Incandescent fixtures have an efficacy of less than 20 lumens per watt, while fluorescent and LED fixtures typically have lumen per watt efficacy values above 50 and sometimes as high as 100.

APPLICATION

a. Choose High Efficacy Bulbs and Fixtures

For all permanently installed lighting fixtures in the home, install lighting with an efficacy of at least 40 to 60 lumens per watt.

High efficacy fluorescent and LED bulbs and fixtures come in a variety of sizes, shapes, color temperatures, and mounting and control options. Where applicable, consider installing controls such as occupancy sensors and photocells to ensure that lights are turned on only when necessary.

b. Follow Lighting Design Best Practices

Install a lighting system designed to deliver appropriate ambient, task and accent lighting to meet the needs of each space in the home. Homes are often designed with excess ambient lighting in hallways and living rooms, and not enough task lighting in areas such as the kitchen. Consult the Illuminating Engineering Society (IES) Lighting Handbook or Lighting Ready Reference for appropriate footcandle measurements throughout the home (www.iesna.org).

Consider consulting with a Lighting Certified (LC) professional to help with bulb wattage choices and lighting fixture placement to maximize lighting and control glare (to find an LC professional, go to www.ncqlp.org). Many utilities have lighting experts on staff to evaluate plans or physically evaluate spaces.

BENEFIT

A well-designed lighting system that combines high efficacy lighting, controls, and daylighting uses less energy, reduces energy costs and improves the quality of the indoor environment.

N. Other

1. Incorporate GreenPoint Rated Checklist in Blueprints

DESCRIPTION

Attaching the Single Family GreenPoint Rated Checklist to the blueprints makes it easier for everyone involved—including the building professionals, home buyer and municipality—to see which green features are included.

APPLICATION

In one of the first pages of the project blueprints, include the GreenPoint Rated Checklist, with the applicable points checked off. To make verification easier, next to each checklist item note the blueprint page number that corresponds to that particular item and make an obvious note on that blueprint page.

BENEFIT

Including the GreenPoint Rated Checklist in the blueprints raises the visibility of green building. This may encourage builders to incorporate more green features. It also provides a quick reference and benchmark for the builder, buyer and municipality.

2. Hold a Preconstruction Kick-Off Meeting

DESCRIPTION

A preconstruction kick-off meeting entails an in-person meeting between owners, GreenPoint Raters, contractors, subcontractors, architects, landscape architects, and others involved in the project during the construction phase.

APPLICATION

Hold the preconstruction kick-off meeting before construction begins, preferably on site. Review the GreenPoint Rated process and the expected roles of each team member. To help ensure that the project's green building and rating goals will be met, make sure each team member's scope of work and contract reflects their roles and responsibilities. In the documentation of this meeting, outline the GreenPoint Rated process for the specific project; keep the documentation for reference throughout the project development.

BENEFIT

When all parties are aware of their role in the GreenPoint Rated process from the beginning of construction, they will be more prepared to meet the project's objectives. Important records, such as documentation of construction waste generated, are more likely to be produced and retained if contractors and subcontractors are aware of the value of this information to green building certification.

3. Management Staff Are Certified Green Building Professionals

DESCRIPTION

The homebuilder's management staff and other building professionals can take a Build It Green course to become Certified Green Building Professionals (CGBP).

APPLICATION

Build It Green offers a two-day CGBP course in locations throughout California. By taking the course and passing a test, participants become certified and may add the CGBP designation to their business credentials.

BENEFIT

Management team members who understand the goals and practices of green building can more effectively integrate them into the company's operations and products.

4. Develop a Green Homeowner's Manual and Conduct Walk-throughs

DESCRIPTION

A green homeowner's manual describes the home's green features and their benefits. It also gives important information about maintaining and operating the home. Provide walk-throughs for new homeowners to inform them about basic and advanced home operations and maintenance procedures.

APPLICATION

Develop a green homeowner's manual or include a green section in the standard manual. Include the following information:

- Description of the home's green building features
- Explanation of the importance of maintenance and operations to achieve ongoing green building benefits
- Warranty, operation and mainte-

nance instructions for equipment and appliances

- Ways to save water and energy
- Clear labeling of safety valves and controls for major house systems
- Information about keeping gutters clean and checking crawl space for pests and termite tubes
- Information on nontoxic pest control and gardening practices, and healthier cleaning products
- Information on proper landscaping maintenance
- Information on household recycling, and proper handling and disposal of hazardous chemicals

BENEFIT

Manuals and walk-throughs help homeowners maximize their investment by maintaining their home and landscaping in a healthy and environmentally responsible manner. Manuals and walk-throughs may reduce maintenance problems and call-backs.

5. Install Energy and Water Monitors, or Participate in a Demand-Response Program

DESCRIPTION

People are better able to regulate their resource consumption when they have information about their usage patterns. Home energy monitors provide real-time feedback on electricity and/or gas use. Home water monitors give customers a more detailed understanding of their water consumption. Demand–response programs help consumers reduce electricity use during times of peak demand, which may help prevent electric supply shortfalls.

APPLICATION

Home Energy Monitors

These are typically plug-in devices that give a digital read-out of a home's energy usage in real-time. The read-out may provide kilowatt-hour data, cost data, or both. More sophisticated devices allow residents to use their personal computer to monitor their electricity consumption. Some devices allow users to view energy use for the whole house and for individual appliances. Most home energy monitors need to be installed by a licensed electrician.

Home Water Monitors

These measure flow, quantity and temperature of water used in the home. They may be installed separately or in combination with a home energy monitor. Water monitors are generally hard-wired and should be installed by qualified contractors. Wireless systems are available but are more expensive.

Demand–Response Programs

Customers who participate in utility demand–response programs are informed of real-time changes in the price of electricity so they may curtail their usage when demand and rates peak. With a time-of-use price structure, the customer pays less for electricity when demand is low and more during peak demand hours. Or they may agree to have their electricity use automatically reduced during critical times when the electricity grid is approaching capacity. One type of residential demand–response program involves installing a thermostat on the air conditioner that communicates electronically with the utility. During times of very high demand, the utility can automatically adjust the thermostat's temperature setting to reduce air conditioning use. Contact your utility for information.

BENEFIT

Home energy and water monitors encourage conservation by making residents more aware of their usage. They can also be used to help diagnose home performance issues by providing information about energy and water usage patterns over time. With demand-response programs, customers can save money by using less energy at peak times, and utilities are able to curtail peak usage and reduce greenhouse gas emissions.

O. Community Design and Planning

1. Develop Infill Sites

DESCRIPTION

Infill developments reclaim abandoned and underutilized sites and buildings, utilize existing services, and reduce pressure to develop greenfields such as open space and farmland.

APPLICATION

When selecting a development site, choose built urban settings where public infrastructure is already in place. Give preference to locations that are: in a downtown area, targeted for revitalization, close to major employment centers, and/or within an urban growth boundary or designated for development by the local jurisdiction. Also, locate the project within walking distance of a major transit stop; look for locations where good transit service already exists or work with officials to bring public transit to the area.

BENEFIT

Urban infill allows public funds to be used for maintaining or upgrading existing services such as schools, transit and sewers, rather than diverting limited funds to the development of costlier new services.

2. Build on Designated Brownfield Sites

DESCRIPTION

Brownfields are properties that have the presence or potential presence of a hazardous substance, pollutant, or contaminant, as specified by the U.S. Environmental Protection Agency. Brownfields include properties such as gas stations, manufacturing facilities, and industrial yards.

APPLICATION

Use underutilized lands by building on a designated brownfield site. The State of California, the U.S. EPA, and some local governments offer grants, loans and training to help property owners safely develop brownfields for residential use.

BENEFIT

The EPA estimates that there are more than 450,000 brownfields in the U.S. Cleaning up and reinvesting in these properties increases local tax bases, facilitates job growth, utilizes existing infrastructure, takes development pressures off of undeveloped open land, and improves and protects the environment.

3. Cluster Homes and Keep Size in Check

DESCRIPTION

On a given site, there are often many options for locating and orienting homes. Paying careful attention to land use and home size can help conserve natural resources.

APPLICATION

a. Cluster Homes for Land Preservation

Two strategies for minimizing developed areas are clustering homes and building upward instead of outward. Besides preserving open space, certain clustered designs may also use building materials more efficiently if there are shared walls or roofs.

Sacramento Street Cohousing, Berkeley, CA.

b. Conserve Resources by Increasing Density

Developments that allow for more homes on a given site reduce pressure to develop greenfields or open space. Where there is access to public transit or commercial activities, dense developments offer the advantage of shorter commutes, less dependence on cars, and walkable communities.

c. Home Size Efficiency

Homes can be designed to be comfortable and spacious without being excessively large; smaller, more compact homes conserve land, building materials and energy.

BENEFIT

Minimizing the development footprint and providing permanent open spaces can help protect the local ecosystem and enhance the community. Homes that are clustered and not overly large may cost less and require fewer resources to build.

4. Lay Out and Orient Subdivisions for Shading and Solar Access

DESCRIPTION

Planning strategies that take shading and solar access into account can reduce energy use by providing natural cooling in the summer, allowing for passive solar heating in the winter, and making unshaded space available for solar electric and solar thermal systems.

APPLICATION

Orient homes on an east–west axis to facilitate passive solar design, reduce heating and cooling energy

use, and facilitate placement of rooftop solar electric and solar thermal systems. Use alley ways, greenbelts, and other methods to provide good solar access to the homes.

Plan streets and lot layouts to provide for shading of streets by trees to reduce the heat island effect. Keeping streets narrow will make them easier to shade and will contribute to traffic calming, improving safety.

BENEFIT

Planning for solar access and shading can create more pleasant neighborhoods, lower homeowners' energy bills, and reduce reliance on fossil fuel-based energy.

5. Design for Walking and Bicycling

DESCRIPTION

Walking and bicycling are inexpensive forms of transportation but they are often incompatible with conventional car-based development patterns. Convenience, safety and aesthetics are key factors in promoting travel by foot and bicycle.

APPLICATION

a. Provide Pedestrian Access to Neighborhood Services

Build pedestrian-friendly communities that combine residential and commercial spaces so that people can shop, play and meet their daily needs close to where they live.

b. Include Pedestrian Pathways That Connect to Recreation

Many new home developments include plans for new roadways and pedestrian paths. Where applicable, connect walkways to places of interest, such as parks, stores, and recreation areas. Walkways should be separated from roadways.

c. Design Traffic-Calming Elements to Encourage Walking and Bicycling

Design 10-foot vehicle travel lanes with bike lanes, rather than the standard 12-foot vehicle travel lanes. Consider rumble strips, bulb-outs and raised crosswalks to reduce speeding.

BENEFIT

Walking and bicycling are inexpensive, healthy forms of physical activity, transportation and neighborhood interaction. Traffic-calming measures reduce pedestrian accidents and increase neighborhood economic activity and public safety.

6. Design for Safety and Social Gathering

DESCRIPTION

Design buildings and landscapes to deter crime and promote safety through casual observation and community interaction.

APPLICATION

Design all home entrances so that outside callers can be seen from inside the home. Place tall windows with low sill heights at front doors, or use transparent panels in the doors so any occupant, including children and the disabled, can view all visitors.

Orient porches to streets and public spaces to provide natural surveillance. Help keep the community safe and neighborly by orienting windows so that residents can easily view and feel comfortable using nearby areas such as outdoor benches, pathways, pocket parks, children's play areas and other features that promote socializing.

Include community gathering areas such as play structures, parks or gardens. To encourage community gardening and consumption of healthy, local food, provide a shared area for a vegetable garden.

BENEFIT

While it may be possible to deter some crime with tall fences, gates, video surveillance and bright lights, these elements also deter outdoor play and neighborliness. Creating a greater sense of community in residential areas results in safer and more inviting places to live.

7. Design for Diverse Households

DESCRIPTION

Simple universal design elements make it much more likely that residents can remain in their homes as they age, if they become temporarily or permanently disabled, or if they wish to have relatives join their household.

APPLICATION

Design homes so that at least one prominent entrance (not from a garage) has a zero-step clearance, with less than a ½-inch difference in height. Design all main-floor interior doors and passageways to have a minimum 32-inch clear passage space to accommodate disabled persons. Locate at least a half-bath on the ground floor with blocking in the walls for grab bars. Ideally, also locate a bedroom on the ground floor. Consider providing a fully functional, independent unit that would allow extended family members to reside at home yet maintain independence.

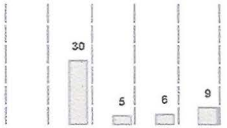
BENEFIT

Over the long term, money can be saved and remodeling waste minimized if homes are designed from the outset to accommodate changing occupant needs and a wider range of physical abilities.

GreenPoint Rated Checklist: Single Family

GreenPointRATED
A PROGRAM OF BUILD IT GREEN

Total Points Targeted: 0



The GreenPoint Rated checklist tracks green features incorporated into the home. A home is only GreenPoint Rated if all features are verified by a Certified GreenPoint Rater through Build It Green. GreenPoint Rated is provided as a public service by Build It Green, a professional non-profit whose mission is to promote healthy, energy and resource efficient buildings in California.
The minimum requirements of GreenPoint Rated are: verification of 50 or more points; Earn the following minimum points per category: Energy (30), Indoor Air Quality/Health (5), Resources (6), and Water (9); and meet the prerequisites A.2.a, H10a., J.2., N.1, and Q0.

This checklist accommodates the verification of mandatory CALGreen measures but does not signify compliance unless accepted by enforcing agency. All CALGreen measures within the checklist must be selected as "Yes" or "n/a" for compliance with GreenPoint Rated. Build It Green is not a code enforcement agency.

The criteria for the green building practices listed below are described in the GreenPoint Rated Single Family Rating Manual. For more information please visit **www.builditgreen.org/greenpointrated**

Single Family New Home 4.2 / 2008 Title 24

Enter Project Name

									Points Achieved	Community	Energy	IAQ/Health	Resources	Water	Notes
A. SITE			Community	Energy	Health/IAQ	Resources	Water			Possible Points					
								1. Protect Topsoil and Minimize Disruption of Existing Plants & Trees							
TBD	FALSE	FALSE	0				0	a. Protect Topsoil and Reuse after Construction	0	1				1	
TBD	FALSE	FALSE					0	b. Limit and Delineate Construction Footprint for Maximum Protection	0					1	
								2. Divert/Recycle Job Site Construction Waste (Including Green Waste and Existing Structures)							
TBD	FALSE	FALSE				N		a. Required: Divert 50% (by weight) of All Construction and Demolition Waste (Recycling or Reuse) (CALGreen Code)	N				R		
TBD	FALSE	FALSE				0		b. Divert 100% of Asphalt and Concrete and 65% (by weight) of Remaining Materials	0				2		
TBD	FALSE	FALSE				0		c. Divert 100% of Asphalt and Concrete and 80% (by weight) of Remaining Materials	0				2		
								3. Use Recycled Content Aggregate (Minimum 25%)							
TBD	FALSE	FALSE				0		a. Walkway and Driveway Base	0				1		
TBD	FALSE	FALSE				0		b. Roadway Base	0				1		
TBD	FALSE	FALSE	0					**4. Cool Site: Reduce Heat Island Effect On Site**	0	1					
								5. Construction Environmental Quality Management Plan, Duct Sealing, and Pre-Occupancy Flush-Out [*This credit is a requirement associated with J4: EPA IAP]							
TBD	FALSE	FALSE			0			a. Duct openings and other related air distribution component openings shall be covered during construction. (CALGreen code if applicable)	0			1			
TBD	FALSE	FALSE			0			b. Full environmental quality management plan and pre-occupancy flush out is conducted (Prerequisite is A5a)	0			1			
								Total Points Available in Site = 12	0						
B. FOUNDATION			Community	Energy	Health/IAQ	Resources	Water			Possible Points					
TBD	FALSE	FALSE				0		**1. Replace Portland Cement in Concrete with Recycled Fly Ash and/or Slag (Minimum 20%)**	0				2		
TBD	FALSE	FALSE				0		**2. Use Frost-Protected Shallow Foundation in Cold Areas (CEC Climate Zone 16)**	0				2		
TBD	FALSE	FALSE			0			**3. Use Radon Resistant Construction** [*This credit is a requirement associated with J4: EPA IAP]	0			2			
TBD	FALSE	FALSE				0		**4. Install a Foundation Drainage System** [*This credit is a requirement associated with J4: EPA IAP]	0				2		
TBD	FALSE	FALSE			0			**5. Moisture Controlled Crawlspace** [*This credit is a requirement associated with J4: EPA IAP]	0			2			
								6. Design and Build Structural Pest Controls							
TBD	FALSE	FALSE				0		a. Install Termite Shields & Separate All Exterior Wood-to-Concrete Connections	0				1		
TBD	FALSE	FALSE				0		b. All Plants Have Trunk, Base, or Stem Located At Least 36 Inches from Foundation	0				1		
								Total Points Available in Foundation = 12	0						
C. LANDSCAPE			Community	Energy	Health/IAQ	Resources	Water			Possible Points					
0%	TRUE	TRUE						*Enter in the % of landscape area. (Projects with less than 15% of the total site area (i.e. total lot size) as landscape area are capped at 6 points for the following measures: C1 through C7 and C9 through C11.*							
TBD	FALSE	FALSE					0	**1. Group Plants by Water Needs (Hydrozoning)**	0					2	

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TBD	FALSE	FALSE					0	**2. Mulch All Planting Beds to the Greater of 3 Inches or Local Water Ordinance Requirement**	0					2	
								3. Construct Resource-Efficient Landscapes							
TBD	FALSE	FALSE					0	a. No Invasive Species Listed by Cal-IPC Are Planted	0					1	
TBD	FALSE	FALSE				0		b. No Plant Species Will Require Shearing	0				1		
TBD	FALSE	FALSE					0	c. 75% of Plants Are Drought Tolerant, California Natives or Mediterranean Species or Other Appropriate Species	0					3	
								4. Minimize Turf in Landscape Installed by Builder							
TBD	FALSE	FALSE					0	a. Turf Shall Not Be Installed on Slopes Exceeding 10% and No Overhead Sprinklers Installed in Areas Less than 8 Feet Wide	0					2	
TBD	0	0					0	b. Turf is Small Percentage of Landscaped Area (2 Points for ≤25%, 4 Points for ≤10%)	0					4	
TBD	FALSE	FALSE	0	0			0	**5. Plant Shade Trees**	0	1	1			1	
	FALSE							**6. Install High-Efficiency Irrigation Systems**							
TBD	FALSE	FALSE					0	a. System Uses Only Low-Flow Drip, Bubblers, or Sprinklers	0					2	
TBD	FALSE	FALSE					0	b. System Has Smart (Weather-Based) Controller (CALGreen code if applicable)	0					3	
TBD	FALSE	FALSE					0	**7. Incorporate Two Inches of Compost in the Top 6 to 12 Inches of Soil**	0					3	
								8. Rain Water Harvesting System							
TBD	FALSE	FALSE					0	a. Cistern(s) is Less Than 750 Gallons	0					1	
TBD	FALSE	FALSE					0	b. Cistern(s) is 750 to 2,500 Gallons	0					1	
TBD	FALSE	FALSE					0	c. Cistern(s) is Greater Than 2,500 Gallons	0					1	
TBD	FALSE	FALSE					0	**9. Irrigation System Uses Recycled Wastewater**	0					1	
TBD	FALSE	FALSE					0	**10. Submetering for Landscape Irrigation**	0					1	
								11. Design Landscape to Meet Water Budget							
TBD	FALSE	FALSE					0	a. Install Irrigation System That Will Be Operated at ≤70% Reference ET (Prerequisites for Credit are C1. and C2.)	0					1	
TBD	FALSE	FALSE					0	b. Install Irrigation System That Will Be Operated at ≤50% Reference ET (Prerequisites for Credit are C1, C2, and C6a or C6b.)	0					1	
TBD	FALSE	FALSE				0		**12. Use Environmentally Preferable Materials for 70% of Non-Plant Landscape Elements and Fencing** A) FSC-Certified Wood, B) Reclaimed, C) Rapidly Renewable, D) Recycled-Content E) Finger-Jointed or F) Local	0				1		
TBD	FALSE	FALSE	0					**13. Reduce Light Pollution by Shielding Fixtures and Directing Light Downward**	0	1					
								Total Points Available in Landscape = 35	0						
D. STRUCTURAL FRAME			Community	Energy	Health/IAQ	Resources	Water			Possible Points					
								1. Apply Optimal Value Engineering							
TBD	FALSE	FALSE				0		a. Place Joists, Rafters and Studs at 24-Inch On Center	0				3		
TBD	FALSE	FALSE				0		b. Door and Window Headers are Sized for Load	0				1		
TBD	FALSE	FALSE				0		c. Use Only Cripple Studs Required for Load	0				1		
								2. Construction Material Efficiencies							
TBD	FALSE	FALSE				0		a. Wall and Floor Assemblies (Excluding Solid Wall Assemblies) are Delivered Panelized from Supplier (Minimum of 80% Square Feet)	0				2		
TBD	TRUE							b. Modular Components Are Delivered Assembled to the Project (Minimum 25%)	0				6		
								3. Use Engineered Lumber							
TBD	FALSE	FALSE				0		a. Engineered Beams and Headers	0				1		
TBD	FALSE	FALSE				0		b. Wood I-Joists or Web Trusses for Floors	0				1		
TBD	FALSE	FALSE				0		c. Engineered Lumber for Roof Rafters	0				1		
TBD	FALSE	FALSE				0		d. Engineered or Finger-Jointed Studs for Vertical Applications	0				1		
TBD	FALSE	FALSE				0		e. Oriented Strand Board for Subfloor	0				1		
TBD	FALSE	FALSE				0		f. Oriented Strand Board for Wall and Roof Sheathing	0				1		
TBD	FALSE	FALSE		0				**4. Insulated Headers**	0		1				
								5. Use FSC-Certified Wood							
TBD	0%							a. Dimensional Lumber, Studs and Timber (Minimum 40%)	0				6		
TBD	0%							b. Panel Products (Minimum 40%)	0				3		
								6. Use Solid Wall Systems (Includes SIPS, ICFs, & Any Non-Stick Frame Assembly)							
TBD	FALSE	FALSE				0		a. Floors	0				2		
TBD	FALSE	FALSE				0		b. Walls	0				2		
TBD	FALSE	FALSE				0		c. Roofs	0				1		
TBD	FALSE	FALSE		0				**7. Energy Heels on Roof Trusses** (75% of Attic Insulation Height at Outside Edge of Exterior Wall)	0		1				
								8. Install Overhangs and Gutters							
TBD	FALSE	FALSE				0		a. Minimum 16-Inch Overhangs and Gutters	0				1		
TBD	FALSE	FALSE		0				b. Minimum 24-Inch Overhangs and Gutters	0		1				
								9. Reduce Pollution Entering the Home from the Garage [*This credit is a requirement associated with J4: EPA IAP]							
TBD	FALSE	FALSE			0			a. Install Garage Exhaust Fan OR Build a Detached Garage	0			1			

TBD	FALSE	FALSE			0		b. Tightly Seal the Air Barrier between Garage and Living Area (Performance Test Required)	0		1			
							Total Points Available in Structural Frame and Building Envelope = 39	0					
E. EXTERIOR			Community	Energy	Health/IAQ	Resources	Water		Possible Points				
TBD	FALSE	FALSE				0	**1. Use Environmentally Preferable Decking**	0			2		
TBD	FALSE	FALSE				0	**2. Flashing Installation Techniques Specified and Third-Party Verified** [*This credit is a requirement associated with J4: EPA IAP]	0			1		
TBD	FALSE	FALSE				0	**3. Install a Rain Screen Wall System**	0			2		
TBD	FALSE	FALSE				0	**4. Use Durable and Non-Combustible Siding Materials**	0			1		
TBD	FALSE	FALSE				0	**5. Use Durable and Fire Resistant Roofing Materials or Assembly**	0			2		
							Total Points Available in Exterior = 8	0					
F. INSULATION			Community	Energy	Health/IAQ	Resources	Water		Possible Points				
							1. Install Insulation with 75% Recycled Content						
TBD	FALSE	FALSE				0	a. Walls	0			1		
TBD	FALSE	FALSE				0	b. Ceilings	0			1		
TBD	FALSE	FALSE				0	c. Floors	0			1		
							Total Points Available in Insulation = 3	0					
G. PLUMBING			Community	Energy	Health/IAQ	Resources	Water		Possible Points				
							1. Distribute Domestic Hot Water Efficiently (Max. 5 points, G1a. is a Prerequisite for G1b-e)						
TBD	FALSE	FALSE		0			0	a. Insulate All Hot Water Pipes [*This credit is a requirement associated with J4: EPA IAP]	0	1			1
TBD	FALSE	FALSE					0	b. Use Engineered Parallel Plumbing	0				1
TBD	FALSE	FALSE					0	c. Use Engineered Parallel Plumbing with Demand Controlled Circulation Loop(s)	0				1
TBD	FALSE	FALSE		0			0	d. Use Traditional Trunk, Branch and Twig Plumbing with Demand Controlled Circulation Loop(s)	0	1			2
TBD	FALSE	FALSE		0		0	0	e. Use Central Core Plumbing	0	1		1	1
								2. Water Efficient Fixtures					
TBD	FALSE	FALSE					0	a. High Efficiency Showerheads ≤2.0 Gallons Per Minute (gpm) at 80 psi. (Multiple showerheads shall not exceed maximum flow rates) (CALGreen code if applicable)	0				3
TBD	FALSE	FALSE					0	b. High Efficiency Bathroom Faucets ≤ 1.5 gpm at 60psi (CALGreen code)	0				1
TBD	FALSE	FALSE					0	c. High Efficiency Kitchen and Utility Faucets ≤1.8 gpm (CALGreen code if applicable)	0				1
TBD	FALSE	FALSE					0	**3. Install Only High Efficiency Toilets (Dual-Flush or ≤1.28 Gallons Per Flush (gpf))** (CALGreen code if applicable)	0				2
								Total Points Available in Plumbing = 12	0				
H. HEATING, VENTILATIO			Community	Energy	Health/IAQ	Resources	Water		Possible Points				
								1. Properly Design HVAC System and Perform Diagnostic Testing					
TBD	FALSE	FALSE		0				a. Design and Install HVAC System to ACCA Manual J, D, and S Recommendations (CALGreen code if applicable) [*This credit is a requirement associated with J4: EPA IAP]	0	4			
TBD	FALSE	FALSE		0				b. Test Total Supply Air Flow Rates [*This credit is a requirement associated with J4: EPA IAP]	0	1			
TBD	FALSE	FALSE		0				c. Third Party Testing of Mechanical Ventilation Rates for IAQ (meet ASHRAE 62.2)	0	1			
								2. Install Sealed Combustion Units [*This credit is a requirement associated with J4: EPA IAP]					
TBD	FALSE	FALSE			0			a. Furnaces	0		2		
TBD	FALSE	FALSE			0			b. Water Heaters	0		2		
TBD	FALSE	FALSE		0	0			**3. Install High Performing Zoned Hydronic Radiant Heating**	0	1	1		
TBD	FALSE	FALSE	0					**4. Install High Efficiency Air Conditioning with Environmentally Preferable Refrigerants**	0	1			
								5. Design and Install Effective Ductwork					
TBD	FALSE	FALSE		0				a. Install HVAC Unit and Ductwork within Conditioned Space	0	1			
TBD	FALSE	FALSE		0				b. Use Duct Mastic on All Duct Joints and Seams [*This credit is a requirement associated with J4: EPA IAP]	0	1			
TBD	FALSE	FALSE		0				c. Pressure Relieve the Ductwork System [*This credit is a requirement associated with J4: EPA IAP]	0	1			
TBD	FALSE	FALSE			0			**6. Install High Efficiency HVAC Filter (MERV 6+)** [*This credit is a requirement associated with J4: EPA IAP]	0		1		
TBD	FALSE	FALSE			0			**7. No Fireplace OR Install Sealed Gas Fireplace(s) with Efficiency Rating >60% using CSA Standards** [*This credit is a requirement associated with J4: EPA IAP]	0		1		
TBD	FALSE	FALSE			0			**8. Install ENERGY STAR Bathroom Fans on Timer or Humidistat** (CALGreen code if applicable)	0		1		
								9. Install Mechanical Ventilation System for Cooling (Max. 4 Points)					
TBD	FALSE	FALSE		0				a. Install ENERGY STAR Ceiling Fans & Light Kits in Living Areas & All Bedrooms	0	1			
TBD	FALSE	FALSE		0				b. Install Whole House Fan (Credit Not Available if H9c Chosen) (CALGreen code if applicable)	0	1			
TBD	FALSE	FALSE		0				c. Automatically Controlled Integrated System with Variable Speed Control	0	3			

	FALSE							**10. Advanced Mechanical Ventilation for IAQ**				
TBD	FALSE	FALSE			N			a. *Required:* Compliance with ASHRAE 62.2 Mechanical Ventilation Standards (as adopted in Title 24 Part 6) [*This credit is a requirement associated with J4: EPA IAP]	N	R		
TBD	FALSE	FALSE			0			b. Advanced Ventilation Practices (Continuous Operation, Sone Limit, Minimum Efficiency, Minimum Ventilation Rate, Homeowner Instructions)	0	1		
TBD	FALSE	FALSE			0			c. Outdoor Air Ducted to Bedroom and Living Areas of Home	0	2		
TBD	FALSE	FALSE			0			**11. Install Carbon Monoxide Alarm(s)** (or No Combustion Appliances in Living Space and No Attached Garage) [*This credit is a requirement associated with J4: EPA IAP]	0	1		
								Total Points Available in Heating, Ventilation and Air Conditioning = 27	0			
I. RENEWABLE ENERGY			Community	Energy	Health/IAQ	Resources	Water			Possible Points		
TBD	FALSE	FALSE			0			**1. Pre-Plumb for Solar Water Heating**	0	1		
TBD	FALSE	FALSE			0			**2. Install Wiring Conduit for Future Photovoltaic Installation & Provide 200 ft² of South-Facing Roof**	0	1		
0.0%	FALSE	FALSE		0				**3. Offset Energy Consumption with Onsite Renewable Generation (Solar PV, Solar Thermal, Wind)** *Enter % total energy consumption offset, 1 point per 4% offset*	0	25		
								Total Available Points in Renewable Energy = 27	0			
J. BUILDING PERFORMAI			Community	Energy	Health/IAQ	Resources	Water			Possible Points		
								1. Building Envelope Diagnostic Evaluations				
TBD	FALSE	FALSE		0				a. Verify Quality of Insulation Installation & Thermal Bypass Checklist before Drywall [*This credit is a requirement associated with J4: EPA IAP]	0	1		
TBD	FALSE	FALSE		0				b. House Passes Blower Door Test [*This credit is a requirement associated with J4: EPA IAP]	0	1		
TBD	FALSE	FALSE		0				c. Blower Door Results are Max 2.5 ACH_{50} for Unbalanced Systems (Supply or Exhaust) or Max 1.0 ACH_{50} for Balanced Systems (2 Total Points for J1b. and J1c.)	0	1		
TBD	FALSE	FALSE			0			d. House Passes Combustion Safety Backdraft Test	0	1		
0%	FALSE	FALSE		0				**2. *Required:* Building Performance Exceeds Title 24 (Minimum 15%)** *(Enter the Percent Better Than Title 24, Points for Every 1% Better Than Title 24)*	0	≥30		
TBD	FALSE	FALSE			0			**3. Design and Build Near Zero Energy Homes** *(Enter number of points, minimum of 2 and maximum of 6 points)*	0	6		
TBD	FALSE	FALSE			0			**4. Obtain EPA Indoor airPlus Certification** *(Total 42 points, not including Title 24 performance; read comment)*	0	2		
TBD	FALSE	FALSE		0				**5. Title 24 Prepared and Signed by a CABEC Certified Energy Plans Examiner (CEPE)**	0	1		
								6. Participation in Utility Program with Third Party Plan Review				
TBD	FALSE	FALSE		0				a. Energy Efficiency Program [*This credit is a requirement associated with J4: EPA IAP]	0	1		
TBD	FALSE	FALSE		0				b. Renewable Energy Program with Min. 30% Better Than Title 24 (High Performing Home)	0	1		
								Total Available Points in Building Performance = 45+	0			
K. FINISHES			Community	Energy	Health/IAQ	Resources	Water			Possible Points		
TBD	FALSE	FALSE			0			**1. Design Entryways to Reduce Tracked-In Contaminants**	0	1		
								2. Use Low-VOC or Zero-VOC Paint (Maximum 3 Points)				
TBD	FALSE	FALSE			0			a. Low-VOC Interior Wall/Ceiling Paints (CALGreen code if applicable) (<50 Grams Per Liter (gpl) VOCs Regardless of Sheen) [*This credit is a requirement associated with J4: EPA IAP]	0	1		
TBD	FALSE	FALSE			0			b. Zero-VOC: Interior Wall/Ceiling Paints (<5 gpl VOCs Regardless of Sheen)	0	2		
TBD	FALSE	FALSE			0			**3. Use Low-VOC Coatings that Meet SCAQMD Rule 1113 (CALGreen code if applicable) [*This credit is a requirement associated with J4: EPA IAP]**	0	2		
TBD	FALSE	FALSE			0			**4. Use Low-VOC Caulks, Construction Adhesives and Sealants that Meet SCAQMD Rule 1168 (CALGreen code if applicable)**	0	2		
TBD	FALSE	FALSE				0		**5. Use Recycled-Content Paint**	0	1		
	FALSE							**6. Use Environmentally Preferable Materials for Interior Finish** A) FSC-Certified Wood, B) Reclaimed, C) Rapidly Renewable, D) Recycled-Content or E) Finger-Jointed F) Local				
TBD	FALSE	2				0		a. Cabinets (50% Minimum)	0	3		
TBD	FALSE	1				0		b. Interior Trim (50% Minimum)	0	2		
TBD	FALSE	1				0		c. Shelving (50% Minimum)	0	2		
TBD	FALSE	1				0		d. Doors (50% Minimum)	0	2		
TBD	FALSE	1				0		e. Countertops (50% Minimum)	0	2		

TBD	FALSE	FALSE			0		7. Reduce Formaldehyde in Interior Finish – Meet Current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits by Mandatory Compliance Dates (CALGreen code if applicable) [*This credit is a requirement associated with J4: EPA IAP]	N		0			
							8. Reduce Formaldehyde in Interior Finish - Exceed Current CARB ATCM for Composite Wood Formaldehyde Limits Prior to Mandatory Compliance Dates						
TBD	FALSE	FALSE			0		a. Doors (90% Minimum)	0		1			
TBD	FALSE	FALSE			0		b. Cabinets & Countertops (90% Minimum)	0		2			
TBD	FALSE	FALSE			0		c. Interior Trim and Shelving (90% Minimum)	0		1			
TBD	FALSE	FALSE			0		9. After Installation of Finishes, Test of Indoor Air Shows Formaldehyde Level <27ppb	0		3			
							Total Available Points in Finishes = 27	0					
L. FLOORING			Community	Energy	Health/IAQ	Resources	Water		Possible Points				
TBD	TRUE	FALSE				FALSE	1. Use Environmentally Preferable Flooring (Minimum 15% Floor Area) A) FSC-Certified Wood, B) Reclaimed or Refinished, C) Rapidly Renewable, D) Recycled-Content, E) Exposed Concrete, F) Local. *Flooring Adhesives Must Meet SCAQMD Rule 1168 for VOCs.*	0			4		
TBD	FALSE	FALSE		0			2. Thermal Mass Floors (Minimum 50%)	0	1				
TBD	FALSE	FALSE			0		3. Low Emitting Flooring (Section 01350, CRI Green Label Plus, Floorscore [*This credit is a requirement associated with J4: EPA IAP]	0		3			
TBD	FALSE	FALSE					4. All carpet and 50% of Resilient Flooring is low emitting. (CALGreen code if applicable)	N					
							Total Available Points in Flooring = 8	0					
M. APPLIANCES AND LIG			Community	Energy	Health/IAQ	Resources	Water		Possible Points				
TBD	FALSE	FALSE		0			0	1. Install ENERGY STAR Dishwasher (Must Meet Current Specifications)	0	1			1
								2. Install ENERGY STAR Clothes Washer					
TBD	FALSE	FALSE		0			0	a. Meets ENERGY STAR and CEE Tier 2 Requirements (Modified Energy Factor 2.0, Water Factor 6.0 or less)	0	1			2
TBD	FALSE	FALSE					0	b. Meets ENERGY STAR and CEE Tier 3 Requirements (Modified Energy Factor 2.2, Water Factor 4.5 or less)	0				2
								3. Install ENERGY STAR Refrigerator					
TBD	FALSE	FALSE		0				a. ENERGY STAR Qualified & < 25 Cubic Feet Capacity	0	1			
TBD	FALSE	FALSE		0				b. ENERGY STAR Qualified & < 20 Cubic Feet Capacity	0	1			
								4. Install Built-in Recycling Center or Composting Center					
TBD	FALSE	FALSE				0		a. Built-In Recycling Center	0			1	
TBD	FALSE	FALSE				0		b. Built-In Composting Center	0			1	
								5. Install High-Efficacy Lighting and Design Lighting System					
TBD	FALSE	FALSE		0				a. Install High-Efficacy Lighting	0	1			
TBD	FALSE	FALSE		0				b. Install a Lighting System to IESNA Footcandle Standards or Hire Lighting Consultant	0	1			
								Total Available Points in Appliances and Lighting = 13	0				
N. OTHER			Community	Energy	Health/IAQ	Resources	Water		Possible Points				
TBD	FALSE	FALSE				N		1. *Required:* Incorporate GreenPoint Rated Checklist in Blueprints [*This credit is a requirement associated with J4: EPA IAP]	N			R	
TBD	FALSE	FALSE	0					2. Pre-Construction Kick-Off Meeting with Rater and Subs	0	1			
TBD	FALSE	FALSE	0					3. Homebuilder's Management Staff are Certified Green Building Professionals	0	1			
								4. Develop Homeowner Education					
TBD	FALSE	FALSE		0			0	a. Develop Homeowner Manual of Green Features/Benefits (CALGreen code if applicable) [*This credit is a requirement associated with J4: EPA IAP]	0	1			1
TBD	FALSE	FALSE			0			b. Conduct Educational Walkthroughs (Prerequisite is N4a) [*This credit is a requirement associated with J4: EPA IAP]	0		1		
TBD	FALSE	FALSE		0				5. Install a Home System Monitor OR Participate in a Time-of-Use Pricing Program	0	1			
								Total Available Points in Other = 6	0				
O. COMMUNITY DESIGN &			Community	Energy	Health/IAQ	Resources	Water		Possible Points				
								1. Develop Infill Sites					
TBD	FALSE	FALSE	0			0		a. Project is an Urban Infill Development	0	1		1	
TBD	FALSE	FALSE	0					b. Home(s)/Development is Located within 1/2 Mile of a Major Transit Stop	0	2			
TBD	FALSE	FALSE	0					2. Build on Designated Brownfield Site	0	3			
								3. Cluster Homes & Keep Size in Check					
TBD	FALSE	FALSE	0			0		a. Cluster Homes for Land Preservation	0	1		1	
TBD	FALSE	FALSE	0			0		b. Conserve Resources by Increasing Density (10 Units per Acre or Greater)	0	2		2	
		0				0		c. Home Size Efficiency	0			9	
								i. Enter Average Unit Square Footage					

											ii. Enter Average Number of Bedrooms/Unit							
											4. Design for Walking & Bicycling							
	FALSE	0									a. Site Has Pedestrian Access Within 1/2 Mile of Community Services: TIER 1: Enter Number of Services Within 1/2 Mile 1) Day Care 2) Community Center 3) Public Park 4) Drug Store 5) Restaurant 6) School 7) Library 8) Farmer's Market 9) After School Programs 10) Convenience Store Where Meat & Produce are Sold							
	FALSE										TIER 2: Enter Number of Services Within 1/2 Mile 1) Bank 2) Place of Worship 3) Laundry/Cleaners 4) Hardware 5) Theater/Entertainment 6) Fitness/Gym 7) Post Office 8) Senior Care Facility 9) Medical/Dental 10) Hair Care 11) Commercial Office or Major Employer 12) Full Scale Supermarket							
			0								i. 5 Services Listed Above (Tier 2 Services Count as 1/2 Service Value)	0	1					
			0								ii. 10 Services Listed Above (Tier 2 Services Count as 1/2 Service Value)	0	1					
TBD	FALSE	FALSE	0								b. Development is Connected with A Dedicated Pedestrian Pathway to Places of Recreational Interest Within 1/4 mile	0	1					
TBD	FALSE	FALSE	0								c. Install Traffic Calming Strategies (Minimum of Two): - Designated Bicycle Lanes are Present on Roadways; - Ten-Foot Vehicle Travel Lanes; - Street Crossings Closest to Site are Located Less Than 300 Feet Apart; - Streets Have Rumble Strips, Bulbouts, Raised Crosswalks or Refuge Islands	0	2					
											5. Design for Safety & Social Gathering							
TBD	FALSE	FALSE	0								a. All Home Front Entrances Have Views from the Inside to Outside Callers	0	1					
TBD	FALSE	FALSE	0								b. All Home Front Entrances Can be Seen from the Street and/or from Other Front Doors	0	1					
TBD	FALSE	FALSE	0								c. Orient Porches (min. 100sf) to Streets and Public Spaces	0	1					
TBD	FALSE	FALSE	0								d. Development Includes a Social Gathering Space	0	1					
											6. Design for Diverse Households (6a. Is a Prerequisite for 6b. and 6c.)							
TBD	FALSE	FALSE	0								a. All Homes Have At Least One Zero-Step Entrance	0	1					
TBD	FALSE	FALSE	0								b. All Main Floor Interior Doors & Passageways Have a Minimum 32-Inch Clear Passage Space	0	1					
TBD	FALSE	FALSE	0								c. Locate Half-Bath on the Ground Floor	0	1					
TBD	FALSE	FALSE	0								d. Provide Full-Function Independent Rental Unit	0	1					
											Total Achievable Points in Community Design & Planning = 35	0						
P. INNOVATION			Community	Energy	Health/IAQ	Resources	Water						Possible Points					
											A. Site							
											1. Stormwater Control: Prescriptive Path (Maximum of 3 Points, Mutually Exclusive with PA2.)							
TBD	FALSE	FALSE	0								a. Use Permeable Paving for 25% of Driveways, Patios and Walkways	0	1					
TBD	FALSE	FALSE	0								b. Install Bio-Retention and Filtration Features	0	2					
TBD	FALSE	FALSE	0								c. Route Downspout Through Permeable Landscape	0	1					
TBD	FALSE	FALSE	0								d. Use Non-Leaching Roofing Materials	0	1					
TBD	FALSE	FALSE	0								e. Include Smart Street/Driveway Design	0	1					
TBD	FALSE	FALSE	0								2. Stormwater Control: Performance Path (Mutually Exclusive with PA1): Perform Soil Percolation Test and Capture and Treat 85% of Total Annual Runoff	0	3					
											C. Landscape							
TBD	FALSE	FALSE					0				1. Meet Local Landscape Program Requirement	0					2	
											D. Structural Frame & Building Envelope							
											1. Design, Build and Maintain Structural Pest and Rot Controls							
TBD	FALSE	FALSE				0					a. Locate All Wood (Siding, Trim, Structure) At Least 12" Above Soil	0				1		
TBD	FALSE	FALSE				0					b. All Wood Framing 3 Feet from the Foundation is Treated with Borates (or Use Factory-Impregnated Materials) OR Walls are Not Made of Wood	0				1		
TBD	FALSE	FALSE			0	0					2. Use Moisture Resistant Materials in Wet Areas: Kitchen, Bathrooms, Utility Rooms, and Basements [*This credit is a requirement associated with J4: EPA IAP]	0			1	1		
											E. Exterior							
TBD	FALSE	FALSE	0	0							1. Vegetated Roof (Minimum 25%)	0	2	2				
											G. Plumbing							
TBD	FALSE	FALSE					0				1. Greywater Pre-Plumbing (Includes Washing Machine at Minimum)	0					1	
TBD	FALSE	FALSE					0				2. Greywater System Operational (Includes Washing Machine at Minimum)	0					2	
TBD	FALSE	FALSE					0				3. Innovative Wastewater Technology (Constructed Wetland, Sand Filter, Aerobic System)	0					1	
TBD	FALSE	FALSE					0				4. Composting or Waterless Toilet	0					2	
TBD	FALSE	FALSE		0							5. Install Drain Water Heat-Recovery System	0		1				
TBD	FALSE	FALSE		0							6. Install a Hot Water Desuperheater	0		2				
											H. Heating, Ventilation, and Air Conditioning							
TBD	FALSE	FALSE			0						1. Humidity Control Systems (Only in California Humid/Marine Climate Zones 1,3,5,6,7) [*This credit is a requirement associated with J4: EPA IAP]	0			1			

TBD	FALSE	FALSE		0				2. Design HVAC System to Manual T for Register Design	0		1					
								K. Finishes								
TBD	FALSE	FALSE				0		1. Materials Meet SMaRT Criteria *(Select the number of points, up to 5 points)*	0					5		
								N. Other								
TBD	FALSE	FALSE				0		1. Detailed Durability Plan and Third-Party Verification of Plan Implementation	0					2		
								2. Educational Signage of Project's Green Features								
TBD	FALSE	FALSE	0					a. Promotion of Green Building Practices	0	1						
TBD	FALSE	FALSE	0					b. Installed Green Building Educational Signage	0	1						
								3. Innovation: List innovative measures that meet green building objectives. Enter in the number of points in each category for a maximum of 4 points for the measure in the blue cells. Points achieved column will be automatically fill in based on the sum of the points in each category. Points and measures will be evaluated by Build It Green.								
TBD	FALSE	FALSE	0	0	0	0	0	Innovation: Enter up to 4 Points at right. Enter description here	0					-		
TBD	FALSE	FALSE	0	0	0	0	0	Innovation: Enter up to 4 Points at right. Enter description here	0							
TBD	FALSE	FALSE	0	0	0	0	0	Innovation: Enter up to 4 Points at right. Enter description here	0							
TBD	FALSE	FALSE	0	0	0	0	0	Innovation: Enter up to 4 Points at right. Enter description here	0							
TBD	FALSE	FALSE	0	0	0	0	0	Innovation: Enter up to 4 Points at right. Enter description here	0							
								Total Achievable Points in Innovation = 33+	0							
Q. CALIFORNIA CALGreen CODE											Possible Points					
No	FALSE	FALSE						Home meets all applicable CAL Green measures listed in above Sections A - P of the GreenPoint Rated checklist.	N	R						
								The following measures are mandatory in the CALGreen code and do not earn points in the GreenPoint Rated Checklist, but have been included in the Checklist for the convenience of jurisdictions. *The GreenPoint Rater is not a code enforcement official. The measures in this section may be verified by the GreenPoint Rater at their own discretion and/or discretion of the building official.*								
TBD	FALSE	FALSE						1. CALGreen 4.106.2 Storm water management during construction.	N							
TBD	FALSE	FALSE						2. CALGreen 4.106.3 Design for surface water drainage away from buildings.	N							
TBD	FALSE	FALSE						3. CALGreen 4.303.1 As an alternative to perscriptive compliance, a 20% reduction in baseline water use shall be demonstrated through calculation	N							
TBD	FALSE	FALSE						4. CALGreen 4.406.1 Joints and openings. Annular spaces around pipes, electric cables, conduits, or other openings in plates at exterior walls shall be protected	N							
TBD	FALSE	FALSE						5. CALGreen4.503.1 Gas fireplace shall be a direct-vent sealed-combustion type. Woodstove or pellet stove shall comply with US EPA Phase II emission limits	N							
TBD	FALSE	FALSE						6. CALGreen 4.505.2 Vapor retarder and capillary break is installed at slab on grade foundations.	N							
TBD	FALSE	FALSE						7. CALGreen 4.505.3 19% moisture content of building framing materials	N							
TBD	FALSE	FALSE						8. CALGreen 702.1 HVAC system installers are trained and certified in the proper installation of HVAC systems.	N							
								Total Achievable Points in California Green Code = 0	0							

Summary

Total Available Points in Specific Categories		35	96+	44	110	56
Minimum Points Required in Specific Categories	50	0	30	5	6	9
Total Points Achieved	0	0	0	0	0	0

TOTAL: 0

Project has not yet met the following recommended minimum requirements:

- *Total Project Score of At Least 50 Points*
- *Required measures:*
  - *-A3a: 50% waste diversion by weight*
  - *-H10a: Compliance with ASHRAE 62.2 Mechanical Ventilation Standards*
  - *-J2: 15% above Title 24*
  - *-N1: Incorporate GreenPoint Rated Checklist into blueprints*
- *Minimum points in specific categories:*
  - *-Energy (30 points)*
  - *-IAQ/Health (5 points)*
  - *-Resources (6 points)*
  - *-Water (9 points)*
- *All Applicable CALGreen measures in Sections A-P*

Exhibit "D"
Biological Mitigation Plan

Habitat Mitigation and Monitoring Plan

and

Drainage Swale and Basin Revegetation Plan

for

Seashell Estates Tract 2870

VTSM SOO-062/CUP UPO-138

City of Morro Bay
San Luis Obispo County
California

Prepared for

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November 2011

697.03

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1.0 Introduction

The Seashell Estates project (Project), Tract 2870, is a 10-lot residential subdivision in the City of Morro Bay, San Luis Obispo County, California (Figure 1, Section 10.0). The Project Conditions of Approval (City of Morro Bay 2009) require a pre-construction survey be conducted on all lots prior to development, and preparation of a mitigation and monitoring plan that addresses impacts to onsite habitat. The Conditions of Approval require onsite replacement or preservation of impacted habitat at a one to one ratio (area preserved/replaced to area impacted). Additionally, this plan includes restoration details for the proposed onsite drainage swale and basin (refer to Section 10).

Onsite habitat preservation areas designated by New Life Trust (Applicant) exceed the mitigation requirement for one to one preservation of serpentine bunchgrass grassland and Cambria morning glory habitat. Onsite preservation of Jones' layia, Blochman's dudleya and club-haired mariposa lily habitat is less than one to one. Onsite replacement measures will fulfill the mitigation obligation for these three species. Table 3 in Section 4.3 lists the mitigation requirements for the Project.

This Mitigation and Monitoring Plan (MMP) provides the baseline biological data collected at the Project site by Althouse and Meade, Inc. in 2009. Above Grade Engineering overlaid the Project lot lines, building envelopes and roads on biological resource layers and provided the impact calculations used in this MMP to determine mitigation obligations of the Project. A Mitigation Plan map prepared by Althouse and Meade, Inc. is provided as Figure 2 in Section 10.0 that indicates the location of sensitive resource areas, impact areas, and habitat replacement areas. Figure 3 shows the location of proposed preservation areas that would be protected by open space easement. Figure 4 is the current grading and drainage plan by Above Grade Engineering, provided for reference with the drainage swale and basin revegetation plan (Section 9.0).

2.0 Environmental Setting

The Seashell Estates Project is located on a south-facing grassy hillside with numerous low rock outcrops. A small riparian corridor bounds the west side of the Project. A senior care and assisted care center bounds the southeast property line, open rangeland is to the north and northeast, and State Highway 1 is to the south. The southern end of the property was used to stockpile extra fill dirt from construction of the senior center many years ago. Concrete rubble and other non-soil debris is visible on the surface in some areas. Vegetation on the fill is primarily coyote brush (*Baccharis pilularis*), a native shrub that readily recruits to disturbed areas.

The naturally occurring soils on the grassy hillside are of serpentinite origin, as evidenced by the low outcroppings of serpentine rock. Serpentine rock and soils are high in available magnesium, low in available calcium, contain large amounts of heavy metals, and are often deficient in nitrogen and phosphorous. These characteristics make it very difficult for most species of plants to survive on serpentine soil. Certain species of plants are adapted to these soils, and occur nowhere else but on serpentine outcrops. These

species are serpentine endemics, with many local forms known in San Luis Obispo County. Most serpentine endemics are rare.

Native perennial grasses that have a cespitose, or clumped, growth form are called bunchgrasses. Purple needlegrass (*Nassella pulchra*) is one of the most common bunchgrasses in our area, including on the Project site. Bunchgrass grasslands are considered a sensitive natural community type by the California Department of Fish and Game, and bunchgrass grassland communities on serpentine soils are listed as a separate community type that is also sensitive. Much of the grassy hillside at the Project site is mapped as serpentine bunchgrass grassland, where purple needlegrass occurs at a density of 10 percent or greater (Figure 2, Section 10.0). Areas that do not contain 10 percent or greater of bunchgrasses are dominated by wild oats (*Avena fatua*) and other non-native annual grasses, and are not considered a sensitive community type.

3.0 Pre-construction Survey Results

Pre-construction surveys for special status plants and sensitive habitats were conducted on the property in March and April 2009 by Althouse and Meade, Inc. Four special status plant species and one sensitive habitat type were identified and mapped (Figure 2, Section 10.0).

3.1 Serpentine Bunchgrass Grassland

A vegetation transect survey was conducted at the Project site in 2009 by Althouse and Meade, Inc. in order to locate and map the serpentine bunchgrass grassland identified during pre-construction surveys. Grasslands onsite qualified as the serpentine bunchgrass grassland community type where purple needlegrass, a native bunchgrass, occurred in a density of 10 percent or greater over an area at least one quarter acre in size.

Approximately 60,408 square feet (1.4 acres) of serpentine bunchgrass grassland habitat are mapped at the Project site (Figure 2, Section 10.0). Serpentine bunchgrass grassland occurs in Lots 3, 4, 5, 6, 7, 8 and 9. Impacts to serpentine bunchgrass grassland would occur in each of the lots containing this habitat type. An estimated 22,687 square feet (38 percent of onsite area) would be removed for development of building envelopes and the cul-de-sac. The remaining 37,721 square feet (62 percent) would be preserved in open space areas. Preservation, therefore, provides a 1.7 to 1 mitigation ratio by preserving more than what is impacted. Replacement of serpentine bunchgrass grassland is not required.

3.2 Special Status Plants

Four special status plant species were identified at the Project site: Jones' layia (*Layia jonesii*), Blochman's dudleya (*Dudleya blochmaniae*), Cambria morning glory (*Calystegia subacaulis* ssp. *episcopalis*), and club-haired mariposa lily (*Calochortus clavatus* ssp. *clavatus*) (Table 1). All four of these species occur in surrounding rangelands with serpentine rock outcrops. Development of the Project would impact each of these species except club-haired mariposa lily which occurs entirely in

preservation areas. Mitigation would consist of preservation and replacement of onsite populations of these species at a one to one ratio (Figure 2, Section 10.0).

TABLE 1. SPECIAL STATUS PLANTS. Four special status plants on the California Native Plant Society (CNPS) list were documented at the Project site. No plants listed under the California Endangered Species Act (ESA) or the Federal ESA are present.

Species	CNPS List	California ESA Status	Federal ESA Status
Cambria Morning Glory	CNPS List 1B.2	None	None
Blochman's Dudleya	CNPS List 1B.1	None	None
Jones' Layia	CNPS List 1B.2	None	None
Club-haired Mariposa Lily	CNPS List 4.3	None	None

3.2.1 Jones' Layia

Jones' layia occurs in two small patches at the Project site, both within Lot 5, with a combined area of 966 square feet. Development on Lot 5 would remove 619 square feet, or 64 percent, of the onsite population of Jones' layia. The impact area is within the designated building envelope. The remaining 347 square feet (36 percent) would be preserved within open space areas. Preservation, therefore, provides a 0.6 to 1 mitigation ratio (347 of 619 square feet). The remaining portion, 0.4 to 1, of the mitigation obligation would be satisfied by replacing (creating) 272 square feet of Jones' layia habitat within open space areas on Lot 5 (Figure 2).

3.2.2 Blochman's Dudleya

Blochman's dudleya occurs in numerous patches on rocky serpentine outcrops throughout the hillside grassland at the Project site, specifically within Lots 4, 5, 6, 7 and 8. Of the 7,253 square feet of Blochman's dudleya habitat on the property, development of these lots would remove an estimated 4,913 square feet (68 percent). Impacts would occur from home construction as well as construction of the cul-de-sac. The remaining 2,340 square feet (32 percent) would be preserved within open space areas. Preservation, therefore, provides an approximate 0.5 to 1 mitigation ratio (2,340 of 4,913 square feet). The remaining portion, approximately 0.5 to 1, of the mitigation obligation would be satisfied by replacing (creating) 2,573 square feet of Blochman's dudleya habitat within open space areas (Figure 2).

3.2.3 Cambria Morning Glory

Cambria morning glory occurs in two areas of the Project site, within Lots 3 and 4. Of the 1,947 square feet of Cambria morning glory habitat at the Project site, development of these two lots would impact an estimated 399 square feet (20 percent). Impacts would occur from development of the Lot 4 building envelope. The remaining 1,548 square feet (80 percent) would be preserved within open space areas. Preservation, therefore, provides an approximate 3.9 to 1 mitigation ratio (1,548 to 399 square feet). Mitigation

for Cambria morning glory is nearly four times the one to one requirement. Therefore, replacement areas are not needed for Cambria morning glory mitigation.

3.2.4 Club-haired Mariposa Lily

Club-haired mariposa lily occurs in two areas of the Project site, within Lots 4 and 7. Three plants observed in 2009 occupied a total area estimated at 100 square feet. Development of the Project may affect one occurrence area that contained one club-haired mariposa lily in 2009. Preservation areas would include and protect approximately 75 square feet of club-haired mariposa lily on the property, providing 0.75:1 mitigation. Replacement of approximately 25 square feet of mariposa lily habitat would provide the remaining 0.25:1 mitigation ratio.

4.0 Baseline Information for the Mitigation Site

4.1 Project Location

The Project is located on Teresa Drive at the intersection of South Bay Boulevard and Highway 1, at the east end of the City of Morro Bay (Figure 1, Section 10.0). It is situated within the Morro Bay South United States Geologic Survey 7.5 minute quadrangle, at approximate coordinates of latitude 35.365941 N, longitude -120.826333 W (WGS 84). Elevation varies from approximately 70 to 130 feet above mean sea level. The 5.25-acre project site includes all of the 4.75-acre APN 068-411-008 and a 0.5-acre portion of 068-411-006.

4.2 Responsible Parties

TABLE 2. RESPONSIBLE PARTIES. Contact information for the applicant, lead agency, biological consultant and project planner is provided.

Applicant	Lead Agency
New Life Trust c/o Cathy Novak P.O. Box 296 Morro Bay, CA 93443	**City of Morro Bay** 595 Harbor Street Morro Bay, CA 93442 Contact: Kathleen Wold (805) 772-6200
Biological Consultant	**Project Planner**
Althouse and Meade, Inc. 1602 Spring Street Paso Robles, CA 93446 Contact: Jason Dart (805) 237-9626	**Cathy Novak Consulting** P.O. Box 296 Morro Bay, CA 93443 Contact: Cathy Novak (805) 772-9499

4.3 Project Description

The Project is a 10-lot residential subdivision, with lot sizes varying from approximately one third to two-thirds of an acre. Each lot contains a pre-determined building envelope. A central cul-de-sac would extend north into the property from Theresa Drive, from which each lot would have a private driveway access.

Sensitive biological resources are present on the property, and would be impacted by the Project (refer to Figure 2, Section 10.0). Mitigation consistent with the Project Conditions of Approval (City of Morro Bay 2009) shall consist of onsite preservation of serpentine bunchgrass grassland and Cambria morning glory habitat at a minimum ratio of one to one (area preserved to area impacted). Mitigation for Jones' layia and Blochman's dudleya shall consist of a combination of onsite habitat preservation and habitat replacement to attain the required one to one mitigation ratio.

Onsite sensitive habitat preservation shall be completed by placing an open space easement over suitable onsite habitat, as directed by this MMP (refer to Figure 3, Section 10.0), and according to the requirements of the City of Morro Bay. Onsite sensitive habitat replacement shall be completed by transplantation and seed distribution of rare plants in suitable open space areas (refer to Section 7.0). Calculations for onsite sensitive habitat areas are provided in Table 3. For all preservation and replacement areas, annual monitoring and reporting on the condition of the habitat is required for three years (refer to Sections 8.0 and 9.0).

TABLE 3. MITIGATION REQUIREMENTS. Total area on property, area impacted, preservation area and replacement area are provided. For mitigation areas (preservation and replacement), the mitigation ratio is listed as area impacted to area preserved/replaced.

Resource	Total Area on Property (sq. ft.)	Area Impacted (sq. ft.)	Preservation Habitat Area (sq. ft.) (total minus impacted)	Replacement Habitat Area (sq. ft.) (Impacted minus preserved)
Serpentine Bunchgrass Grassland	60,408	22,687	37,721 1.7:1 ratio	0
Cambria Morning Glory	1,947	399	1,548 3.9:1 ratio	0
Jones' Layia	966	619	347 0.6:1 ratio	272 0.4:1 ratio
Club-haired Mariposa Lily	100	25	75 0.75:1 ratio	25 0.25:1 ratio
Blochman's Dudleya	7,253	4,913	2,340 0.5:1 ratio	2,573 0.5:1 ratio

5.0 Required Permits

The 10-lot subdivision project would be permitted by the City of Morro Bay. The Project would not affect resources regulated by the Clean Water Act or the California or federal Endangered Species Acts, therefore no permits are required from the U.S. Army Corps of Engineers of the U.S. Fish and Wildlife Service. The Project would not affect the California Department of Fish and Game (CDFG) jurisdiction of the riparian habitat on the west side of the Project, therefore a Streambed Alteration Agreement is not required under CDFG code 1600. Restoration activities for special status plants listed by the California Native Plant Society do not require special permits.

The Project site is greater than one acre in size and therefore requires a Stormwater Construction permit under the National Pollutant Discharge Elimination System (NPDES) through the California State Water Resources Control Board.

6.0 Mitigation Work Plan

6.1 Habitat Preservation

Habitat preservation is the first step in the environmental mitigation process for the Project. An open space easement shall be recorded on all areas of the Project site indicated on the Preservation Areas map, per City of Morro Bay requirements (Figure 3, Section 10.0). Open space areas shall be shown on all construction plans. Prior to the start of construction, the Project restoration biologist shall confirm and report to the City of Morro Bay that open space areas are adequately marked in the field to protect them from incidental impacts during construction. During construction, no activities shall be allowed to affect open space areas. Should construction activities result in incidental impacts to open space areas, the Project restoration biologist shall map the impacted areas and the final mitigation obligation will be revised.

6.2 Habitat Replacement

Habitat replacement is required for three special status plant species: Blochman's dudleya, Jones' layia and club-haired mariposa lily. Replacement areas are located on-site within preservation areas. These three rare species have very different requirements for habitat replacement.

Blochman's dudleya is a small perennial succulent-like plant that grows on serpentine rock and rubble, where it rarely exceeds heights of three inches. Replacement of habitat shall be completed by transplanting all individual Blochman's dudleya plants from the impact areas to appropriate serpentine rock or rubble areas within the preservation area. Figure 2 in Section 10.0 indicates an approximate replacement area for Blochman's dudleya, however this may be adjusted in the field by the Project restoration biologist. The highest priority locations for transplantation are suitable rock areas that do not presently contain the species, or are found to contain a low abundance. Transplants will, therefore, create new occurrences and enhance existing ones. Transplantation shall be

completed by a qualified restoration biologist familiar with the horticultural and ecological requirements of the genus Dudleya.

Jones' layia is a small annual wildflower in the sunflower family. Because it is an annual, replacement of habitat shall be completed by seeding appropriate locations within the preservation area. Seeds shall be collected in spring 2011 from all Jones' layia plants within the impact area.

Club-haired mariposa lily is a bulbiferous perennial. The above-ground portion of the plant dies back in the summer and is often not visible. Replacement of habitat for this species shall be completed by transplanting bulbs to suitable habitat within the preservation area. All bulbs within the impact areas shall be transplanted to preservation areas.

6.3 Maintenance and Monitoring

Preservation open space areas are not expected to require any maintenance in order to maintain the existing high habitat functions and values. There are no shrubs present, however grass height can reach three feet during wet years. For fire control purposes, the open space areas may require seasonal mowing. Mowing should be conducted in the early summer, as needed. Special status plants occurring within the open space areas are generally shorter than the surrounding grasses and bloom early in the spring. For these reasons, late spring or early summer mowing would not adversely affect special status plants. Herbicides shall not be used in open space areas.

After transplantation and seeding are complete, an as-built map shall be prepared of the mitigation areas in order to track the success through the monitoring period. Preservation and replacement mitigation areas shall be monitored by a qualified restoration biologist annually for three years (refer to Section 9.0). Monitoring reports shall be submitted to the City of Morro Bay by July 15th of each year.

7.0 Performance Standards and Success Criteria

Project-specific performance standards and success criteria were designed to address a three-year monitoring program for onsite preservation and replacement mitigation areas (Table 4). For preservation areas, monitoring will ensure the baseline condition with respect to sensitive resources is maintained or increased. For replacement areas, monitoring will determine if transplantation and seeding strategies were successful.

TABLE 4. PERFORMANCE STANDARDS AND SUCCESS CRITERIA. Success criteria are outlined through the three year monitoring period. Area of occurrence is the primary performance standard that will be used to determine project success.

Feature	Performance Standard	Assessment Method	Year 1 Success Criteria	Year 2 Success Criteria	Year 3 Success Criteria
Serpentine Bunchgrass Grassland	Area of Occurrence	Map serpentine bunchgrass grassland habitat within preservation area	Equal to or greater than baseline	Equal to or greater than baseline	Equal to or greater than baseline
Blochman's Dudleya	Area of Occurrence	Map occupied areas of occurrence within the preservation area	Equal to or greater than impact area	Equal to or greater than impact area	Equal to or greater than impact area
Jones' Layia	Area of Occurrence	Map occupied areas of occurrence within the preservation area	Equal to or greater than impact area	Equal to or greater than impact area	Equal to or greater than impact area
Cambria Morning glory	Area of Occurrence	Map occupied areas of occurrence within the preservation area	Equal to or greater than impact area	Equal to or greater than impact area	Equal to or greater than impact area
Club-haired Mariposa Lily	Area of Occurrence	Map occupied areas of occurrence within the preservation area	Equal to or greater than impact area	Equal to or greater than impact area	Equal to or greater than impact area

8.0 Monitoring Plan

Mitigation monitoring shall be conducted for three years after implementation of preservation and replacement areas. Upon recording the open space easement(s) and completing transplantation and seeding requirements, a completion report shall be submitted to the City of Morro Bay in order to initiate the monitoring period.

Annual monitoring shall be conducted by a qualified restoration biologist in April of each year. Areas of occurrence for serpentine bunchgrass grassland and special status plants shall be mapped in the field using GPS or survey equipment. Field data shall be overlaid on the baseline datasets for all resources listed in Table 2, and calculations made to determine if success criteria have been met. An annual monitoring report shall be prepared and submitted to the City of Morro Bay by July 15th of each year. Representative photographs and maps shall be included.

9.0 Drainage Swale and Basin Revegetation Plan

The proposed Project is situated on a south-facing slope and will install a drainage swale to convey nuisance water around the developed portion of the site. The drainage swale will convey water southward along the eastern project site boundary where it will empty into an onsite drainage basin (Figure 4, Section 10.0).

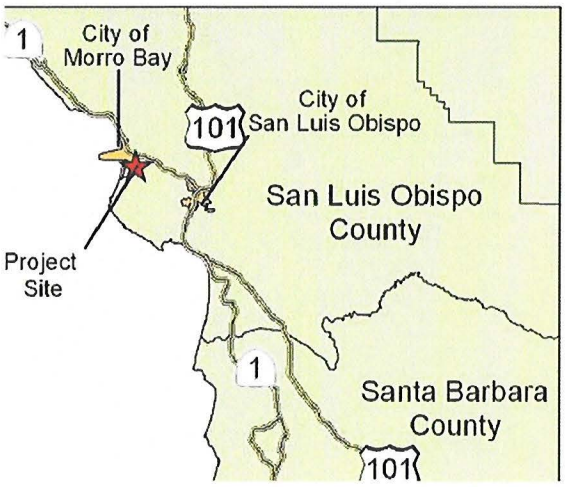
Revegetation of the drainage swale and basin shall be conducted by hydroseed or other acceptable method of seed distribution. The seed m

Table 5. SEED MIX. WETLAND AND UPLAND PLANT SEEDS TO BE PLANTED IN THE DRAINAGE SWALE AND BASIN.

lbs/acre	Scientific name	Common name
2	*Juncus effusus*	Rush
1	*Juncus bufonius*	Toadrush
8	*Leymus triticoides*	Creeping wild-rye
8	*Bromus carinatus*	California brome
12	*Nassella pulchra*	Purple needlegrass
6	*Vulpia microstachys*	Annual fescue
6	*Hordeum brachyantherum*	Meadow barley
1	*Eschscholzia californica*	California poppy

10.0 Figures

- **Figure 1. Aerial Map**
- **Figure 2. Mitigation Plan**
- **Figure 3. Preservation Areas**
- **Figure 4. Grading and Drainage Plan**



Legend

Project Site

0 75 150 300 Feet

Althouse and Meade, Inc.
1602 Spring Street
Paso Robles, CA 93446

Sea Shell Estates Tract 2870

Figure 1. Aerial Map

2009 San Luis Obispo County

Legend

- Tract 2870
- Impact Area
- Blochman's Dudleya
- Cambria Morning Glory
- Jones' Layia
- Club-haired Mariposa Lily
- Serpentine Bunchgrass Grassland

Replacement Areas

- Blochmans Dudleya
- Jones Layia
- Club-haired Mariposa Lily

0 37.5 75 150 Feet

Revised: March 14, 2011

Althouse and Meade, Inc.
1602 Spring Street
Paso Robles, CA 93446

Sea Shell Estates
Tract 2870

Mitigation Plan

2007 Google Earth Aerial
Site located in the City of Morro Bay
GPS Data collected with Trimble Geo XT

Legend

- Tract 2870
- Impact Area
- Preserved Sensitive Resources

N
W E
S

0 37.5 75 150 Feet

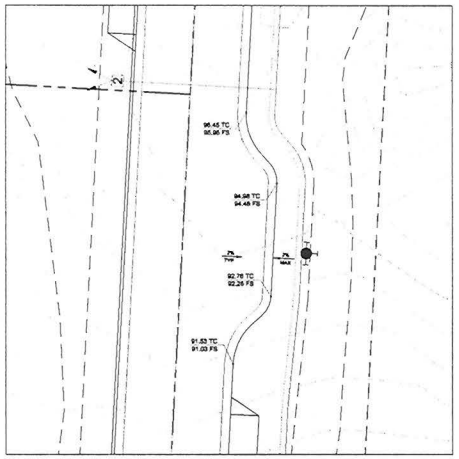
Revised: March 14, 2011

Althouse and Meade, Inc.
1602 Spring Street
Paso Robles, CA 93446

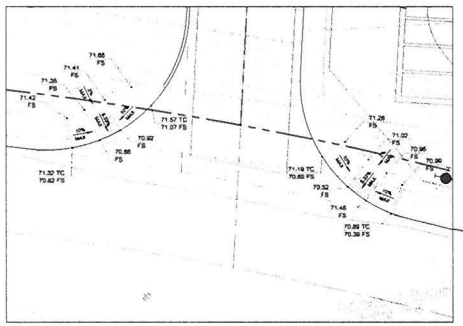
Sea Shell Estates
Tract 2870

Preservation Areas

2007 Google Earth Aerial
Site located in the City of Morro Bay
GPS Data collected with Trimble Geo XT



CURB BULB-OUT DETAIL
SCALE: 1" = 10'



CURB RAMP DETAIL
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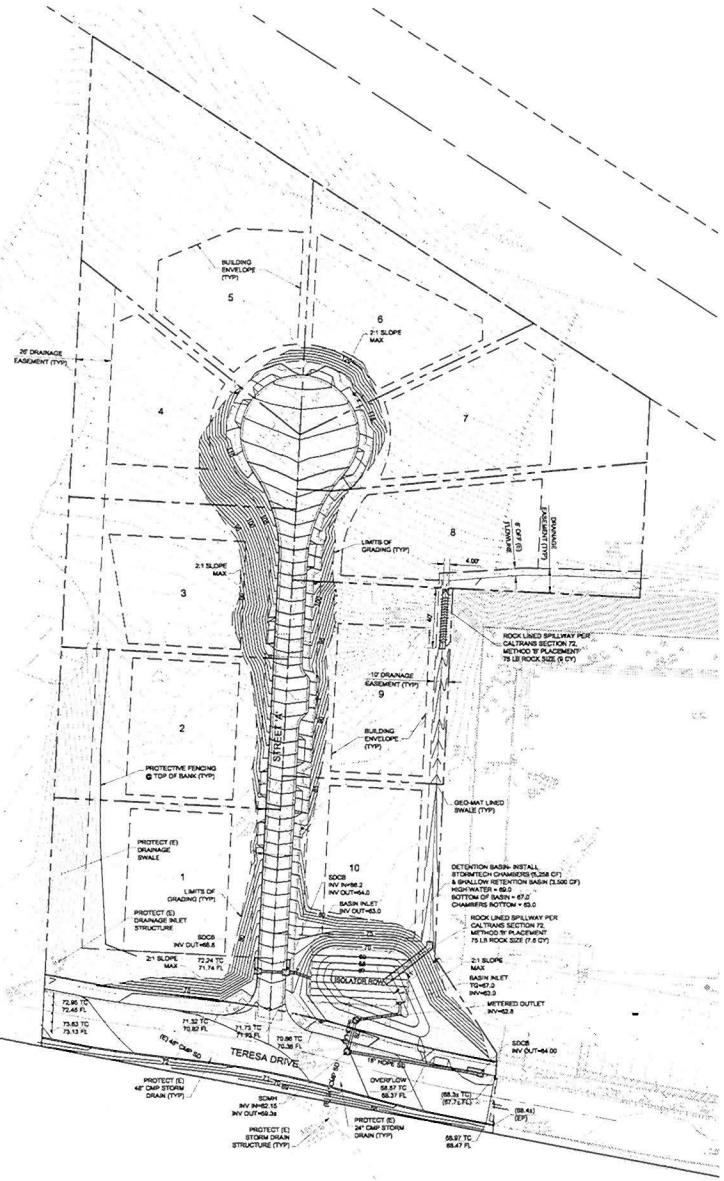
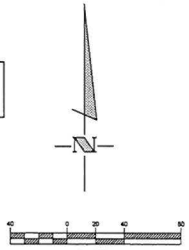


CONTRACTOR TO FIELD VERIFY EXISTING ELEVATIONS PRIOR TO CONSTRUCTION. CONTACT ENGINEER WITH ANY DISCREPANCIES.



GRADING AND DRAINAGE NOTES:

1. ALL GRADING AND CONSTRUCTION SHALL CONFORM TO THE RECOMMENDATIONS IN THE SOILS INVESTIGATION REPORT FOR THIS PROJECT, THE 2010 CALIFORNIA BUILDING CODE AND ADOPTED & AMENDED BY CMB, AND APPENDIX CHAPTER 33 OF THE 1997 UBC (ADOPTED & AMENDD BY CMB & THE MINICIPAL CODE & CMB).
2. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE INDUSTRIAL SAFETY REGULATIONS. THE OWNER AND IT'S REPRESENTATIVES, THE ENGINEER, AND THE ARCHITECT SHALL NOT BE RESPONSIBLE FOR ENFORCING SAFETY REGULATIONS.
3. SOILS ENGINEER TO DETERMINE THE SOIL IS SUITABLE TO SUPPORT THE INTENDED STRUCTURE SUCH REPORT INCLUDING PROGRESS AND/OR COMPACTION REPORTS SHALL BE SUBMITTED TO THE FIELD INSPECTOR PRIOR TO FINAL INSPECTION WHEN A SOILS REPORT IS OBTAINED. THE CITY POLICY REGARDING PAD CERTIFICATION SHALL BE FOLLOWED. WHEN APPLICABLE THE ENGINEER SHALL OBSERVE THE GRADING OPERATION(S) AND PROVIDE THE FIELD INSPECTOR WITH REQUIRED COMPACTION REPORTS AND A REPORT STATING THAT THE GRADING PERFORMED HAS BEEN OBSERVED AND IS IN CONFORMANCE WITH THE CBC & CITY ORDINANCES.
4. MINIMUM SETBACK TO CREEKS AND BLUFFS SHALL BE MAINTAINED. MINIMUM SETBACK OF TWO FEET FROM ALL PROPERTY LINES SHALL BE MAINTAINED FOR ALL GRADING.
5. MINIMUM SLOPE AWAY FROM BUILDINGS FOUNDATION SHALL BE: 5% SLOPE FOR THE FIRST 5 FEET AROUND PERIMETER IN UNPAVED CONDITIONS, AND 2% SLOPE IN PAVED CONDITIONS.
6. DUST CONTROL IS TO BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
7. THE OWNER OR THE ENGINEER OF WORK MAY REQUIRE EROSION CONTROL DEVICE INSTALLATION WITHIN ANY DOWNSTREAM DRAINAGE FACILITY.
8. A STANDBY CREW FOR EMERGENCY WORK SHALL BE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON. NECESSARY MATERIALS SHALL BE AVAILABLE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES WHEN RAIN IS IMMINENT. SEE EROSION CONTROL PLAN FOR CONTACT INFORMATION OF THE PERSON RESPONSIBLE SHOULD AN EMERGENCY OCCURE.
9. ALL PROTECTIVE DEVICES DIRECTED TO BE INSTALLED BY THE CONTRACTOR SHALL BE IN PLACE AT THE END OF EACH WORK DAY WHEN THE FIVE (5) DAY RAIN PROBABILITY EXCEEDS 40%.
10. POSITIVE DRAINAGE SHALL BE PROVIDED AWAY FROM ALL MANMADE SLOPES. NO RUNOFF MAY BE CONCENTRATED.
11. ALL DISTURBED AREAS SHALL BE HYDROSEEDED OR PLANTED WITH COUNTY APPROVED VEGETATION AS SOON AS PRACTICAL AFTER CONSTRUCTION IS COMPLETE.
12. EXPOSED GROUND AREAS THAT ARE PLANNED TO BE REWORKED AT DATES MORE THAN THREE (3) WEEKS AFTER INITAL GRADING SHALL BE SOWN WITH A FAST GERMINATING NATIVE GRASS SEED AND WATERED UNTIL VEGETATION IS ESTABLISHED.
13. ALL DISTURBED SURFACES SLOPED FOUR HORIZONTAL TO ONE VERTICAL (4:1) AND GREATER SHALL BE PREPARED AND MAINTAINED TO CONTROL EROSION BY EFFECTIVE PLANTING TO BE COMPLETED NO LATER THAN THIRTY (30) DAYS PRIOR TO REQUEST FOR FINAL APPROVAL.
14. AN EROSION AND SEDIMENT CONTROL PLAN IS REQUIRED AND SHALL BE IMPLEMENTED WHILE GRADING ACTIVITIES OCCUR DURING THE RAINY SEASON FROM OCTOBER 15th TO APRIL 15th.
15. OVER EXCAVATION, REPLACEMENT AND COMPACTION REQUIREMENTS SHALL CONFORM TO THE SOILS INVESTIGATION REPORT FOR THIS PROJECT.
16. ENGINEERING REPORTS FOR CUT OR FILL SLOPE STEEPER THAN (2:1) SHALL BE SUBMITTED TO THE FIELD INSPECTOR.
17. ALL CONTACT SURFACES BETWEEN ORIGINAL GROUND AND RECOMPACTED FILL MATERIAL SHALL BE EITHER HORIZONTAL OR VERTICAL (PER UBC STANDARD).
18. FILL MATERIAL SHALL BE SPREAD IN LIFTS AS REQUIRED BY THE SOILS INVESTIGATION REPORT. AREAS OF FILL SHALL BE SCARIFIED, BENCHED AND RECOMPACTED PER THE RECOMMENDATIONS IN THE SOILS INVESTIGATION REPORT. FILL OPERATIONS SHALL BE OBSERVED BY THE SOILS ENGINEER. THE MATERIALS FOR ENGINEERED FILL SHALL BE APPROVED BY THE SOILS ENGINEER. ANY IMPORTED MATERIALS MUST BE APPROVED BEFORE BEING BROUGHT TO THE SITE. THE MATERIALS USED SHALL BE FREE OF ORGANIC MATTER AND OTHER DELETERIOUS MATERIALS.
19. FIELD DENSITY TESTS SHALL BE MADE UNDER THE DIRECTION OF THE SOILS ENGINEER ON EACH COMPACTED LAYER, AT LEAST ONE (1) TEST SHALL BE MADE FOR EACH FIVE-HUNDRED (500) CUBIC YARDS, OR A FRACTION THEREOF, PLACED WITH A MINIMUM OF TWO (2) TESTS PER LAYER IN ISOLATED AREAS OR AS DIRECTED BY THE SOILS ENGINEER.
20. UPON COMPLETION OF THE GRADING OPERATION, THE SOILS ENGINEER SHALL CERTIFY THAT ALL GRADING COMPLIES WITH THE RECOMMENDATIONS OF THE SPECIFICATIONS AND THE REFERENCED SOILS INVESTIGATION REPORT.
21. EXPORT MATERIAL (IF ANY) SHALL BE DISPOSED OF IN AN ACCEPTABLE LOCATION.
22. NO CUT OR FILL SLOPES WILL BE CONSTRUCTED STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2:1) WITHOUT JUSTIFICATION FROM THE SOILS ENGINEER.
23. THE PAVING STRUCTURAL SECTION SHALL BE BASED ON THE SOILS TESTS PERFORMED AT THE TIME OF CONSTRUCTION.

PUBLIC IMPROVEMENT PLANS FOR
SEASHELL ESTATES (APN: 068-411-008)

GRADING & DRAINAGE PLAN

DEPARTMENT OF PUBLIC WORKS, CITY OF MORRO BAY
955 SHASTA AVENUE, MORRO BAY, CALIFORNIA 93442

SCALE:	APPROVED BY:	SHEET NO. 2 OF 7 SHEETS
DESIGNED BY: DWB		
DRAWN BY: DWB		DRAWING NO.
CHECKED BY:	CITY ENGINEER DATE	
RECORD DWG.:		

ABOVE GRADE ENGINEERING
778 Osos Street, Suite A
San Luis Obispo, CA 93401
phone: (805) 540-5115
fax: (805) 540-5116
A California Corporation

ENGINEER OF RECORD:
REGISTERED PROFESSIONAL ENGINEER
No. 58625
Exp. 6/30/12
CIVIL
STATE OF CALIFORNIA
COPY

DATE:

SEASHELL ESTATES - TRACT 2870
MORRO BAY, CA

GRADING AND DRAINAGE PLAN

NO.	REVISION	DATE

DESIGNED: DWB
DRAWN: DWB
JOB NUMBER: 09061

SHEET:
C-2

DATE: OCTOBER 13, 2011

PLOT BY: Derrick PLOT DATE: Oct 10, 2011 - 8:40am Drawing name: N:\2009\09061 Seashell\Product\Condors\Sheetfiles\09061-C2-GD.dwg

11.0 References

Althouse and Meade, Inc. 2009. Unpublished field notes from multiple site visits in March and April 2009 to the Seashell Estates property.

California Natural Diversity Database (CNDDB) Rarefind. 2010. The California Department of Fish and Game Natural Diversity Data Base, version 3.1.1. September 2010 data.

City of Morro Bay. 2009. Concept Plan Approval for SOO-062/UPO-138/CPO-207, including Exhibit A Findings for Approval and Revised Exhibit B Conditions of Approval.

DiTomaso, Joseph M., and Evelyn A. Healy. 2007. Weeds of California and Other Western States, Volumes 1 and 2. University of California Agriculture and Natural Resources, Oakland, California.

Hickman, James C. 1993. The Jepson Manual. University of California Press, Berkeley and Los Angeles, California.

Jenesis Ecological Services. 2004. Biological Screening Report for Seashell Estates.

Exhibit A. Implementation Timeline

TABLE 6. IMPLEMENTATION TIMELINE. The recommended months of implementation are provided for each of the major components of the mitigation and monitoring plan.

	January	February	March	April	May	June	July	August	September	October	November	December
Seed Collection				X	X							
Transplantation				X	X							
Annual Monitoring Field Work				X								
Annual Monitoring Report							Due By 15th					
Mowing						X	X	X				