The Materials Handbook

Choosing the Right Materials for High Density Affordable Housing

This workbook was developed for the Mayor's Office of Housing in San Francisco by Asian Neighborhood Design, a highly regarded local community development organization. It's purpose is to share knowledge about building materials and products that have been used in affordable housing. This knowledge was developed through a series of workshops in which maintenance personnel, housing managers, architects, developers and others involved with the construction, operation and maintenance of affordable housing got together to share their experiences – good and bad – with building materials and products used in their developments. The results, therefore, represent a snapshot of expert opinion at a specific point in time.

The Handbook should serve as a good starting point from which affordable housing developers can generate their own information on what works – and what doesn't – for their particular circumstances. In addition, developers are encouraged to convene workshops like those conducted by Asian Neighborhood Design. Input from those who build and manage affordable housing properties is probably the single best way to get reliable information on how various building materials and products perform in affordable housing developments.

Provided with permission by:

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The Materials Handbook

CHOOSING THE RIGHT MATERIALS FOR HIGH DENSITY AFFORDABLE HOUSING

SPONSORED BY

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INTRODUCTION AND HOUSING ISSUES

The **purpose of this workbook** is to share knowledge about products that have been used in affordable housing. Recognizing that affordable housing benefits the community and the individual, this workbook is a resource of information developed from input by people with different levels of experience in housing. Through a forum, maintenance people, housing managers, designers, architects and developers have begun a list of materials which can be used for affordable housing, as well as identifying the advantages and disadvantages, evaluating cost effectiveness, and considering initial cost and long term maintenance.

As new products are developed, new uses are found, and new experiences are gained, information in this workbook may be added or revised accordingly.

Recommendations in this workbook are based on comments and consensus of participants in a series of workshops held by Asian Neighborhood Design at 461 Bush Street, Suite 400, San Francisco, CA 94108 (415) 982-2959 in 1993-1994. Participants included the following people involved in affordable housing:

* State Housing Inspectors
* Architects
* Developer/Construction Managers
* Maintenance Personnel
* Developers/Financial
* Management
* Legal

Notes to consider in the preliminary stages:

◆ Adopt the following philosophy: Make it "bomb proof or easily replaceable".

◆Intensely used housing like SRO or multi family rentals require the highest grade materials to stand up to heavy use. Materials specified for single family houses in the suburbs will not hold up to intense use. However, also remember that "rock solid" does not mean" gold plated". Choosing materials that last and are cost effective over time is not a luxury, but add to the viability of a project.

◆ *Regarding budgeting...*

◆In government funded projects, the State evaluates projects based on many factors, one of which is comparing project cost to average cost per square foot/unit. Projects within 30% of average are considered within range especially if they offer value for the dollar including easy-to-maintain finishes.

◆Developers may be overzealous in their attempts to keep initial costs down and bids are often not consistent with budgets. Developers fight to have minimum contingencies to make projects "pencil out". However, projects historically need 15% to 20% contingencies. Rehab contingencies should always be minimum 20%.

◆Put money in the proforma to replace materials on a life cycle basis.

◆ *Be alert.....*

◆ Environmental hazards including asbestos and lead paint abatement must be considered in rehab projects. Most architects and contractors will exclude these in their contracts. The developer must contract with abatement contractors separately from the contract for construction.

◆ Watch for Contractor irregularities in complying with Affirmative Action/Human Rights Commission (HRC) requirements for minority and women participation.

◆ Check all contractor qualifications and references to assure financial stability, quality work, timely completion, and compliance with Affirmative Action requirements.

◆*Talk to the people who will have to keep the building running....*

◆Maintenance Staff should always be included in programming and early design stages as they know how and why buildings are most abused. Problems arise when developers ignore maintenance staff recommendations to cut initial costs.

◆Checklist should be used to insure discussion of all issues.

◆Always consider initial cost of materials vs. maintenance costs.

◆Loans for affordable housing usually 20 -50 years: maintenance costs should be the deciding factor

◆*Preliminary budgets.....why are they never enough?.....*

-Building Dept issues especially fire and accessibility issues
-Inadequate pre investigation/exploratory demolition
-Concealed conditions, dry rot, framing deficiencies
-"latter day" discovery of mechanical system failure
-Hidden hazardous materials must be abated
-No geotechnical investigation

◆*Simulate real conditions.....*

◆During the construction process the lighting should be simulated to match the permanent lighting to show flaws that will be illuminated with the permanent lighting.

PROBLEMS REPORTED

◆ Many tenants are fearful of reporting problems-leaks, pests, etc for fear of eviction.

◆ Tenants do not know how to maintain the finishes in their units, some from lack of experience, some from differences in cultural background. Some tenants are used to using lots of water to clean flooring. Composition tiles , vinyls and subfloors do not hold up with extensive water.

◆ Inadequate hallway lighting poses security and safety risks.

◆ *Pest Control.....*

◆Periodic inspections (for pest control) can alert management to problems in the units before they become serious problems.
◆Management cannot force tenants to accept pest control; tenants may have physical reactions or other problems with the chemicals.
◆ Passive solutions to pest control can be as, or more, effective than chemicals: fix leaking pipes, caulk any cracks at baseboards, etc. and vacuum frequently . Method of trash collection will also influence presence of pests in a building.

◆ *Help tenants to be part of the solution.....*

◆ Vacuums should be made available to tenants.
◆ Consider central vacuum systems; hoses only supplied to tenants which are easily replaced, although a vacuum cleaner may be a more feasible alternative.
◆ Annual inspection for leaks, damage, etc. can be used to check general condition of the units.

◆ *Educate your tenants.....*

◆ Tenant education is imperative; there is a wide variation in tenant housekeeping practices based on previous experiences and/or cultural differences.
◆ Tenants must be clearly told, what to report (leaking faucets, damaged locks) and when to report it (when the faucet is dripping, not when it runs continuously).
◆ Housekeeping instructions must be given at move in and on a periodic basis.
◆ Some management companies provide a video. Ideally this is shown to a tenant group with management and maintenance staff in attendance to answer questions, to establish a dialog with the tenants.
◆ Set up regular monthly meeting for tenants to convene.
◆ Tenants must be advised on appropriate cleaners: abrasive and/or toxic cleaners must be identified and advised against.

◆ *Avoid problems from the beginning.....*

◆ Management's greatest control is in the initial screening of the tenants and in diligent making repairs. Poorly maintained units are more often abused by the tenants.

PROBLEMS REPORTED

◆ Finishes are chosen for low initial cost without consideration of long term maintenance costs
◆ Finishes that may work well in some applications cannot hold up to heavy use or use different from that intended

◆ Lighting fixtures using different bulbs requires maintenance to have large stock on hand.
◆ Where door stops weren't specified or have been removed, door handles can make holes in the wall.

◆ *Specify extra stock for repairs.....*

◆ Stock overage of all flooring materials should be ordered so that repairs can be made with similar dye lots.
◆ All stock MUST BE CLEARLY MARKED:
Paint cans marked with color and location used
Finish materials marked with product and location used.
(Specify % of overage contractor must provide and note that it must be clearly marked.)

◆ *Provide staff with resouces to maintain their building...*

◆ Specify contractors to leave maintenance manual with operating manuals, instructions and warrentees for all products and equipment.
◆Provide color charts with brand names, color numbers and location of materials
◆Provide brand names of products and suppliers to contact for replacement or repair.
◆ As-built drawings usually required of the contractor frequently disappear. Some lenders require a copy of these as-builts to provide a back up in case of loss or change of management. Consider specifying 2 copies of the as builts as a regular practice.
◆ Specify that, as part of the contract, the contractor must conduct a walkthru with the maintenance staff to show how to operate and shut off all systems. Also specify a second mandatory walkthru to be scheduled for 11 months after completion to identify defects covered under the one-year warrantee.

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DESIGN ISSUES

BUILDING EXTERIOR

- The project design, including the exposed roofing and exterior finish materials, should be compatible with the surrounding neighborhood and create a strong visual relationship with its built context.
- Buildings should achieve a human scale and interest.
- Building entries should create a sense of entry or focal point for the structure and fenestration.
- Construction materials selected should be low maintenance, durable and suitable to the environmental conditions to which the product will be installed.
- Colors and materials should be subdued and reticent in general with the goal of fitting into the built context. Reflective cladding and, or, glazing is discouraged.
- Code required elements such as parapet walls and screen walls should be treated as an integral part of the architecture and these elements should not visibly weaken the design. Rooftop equipment, vents, and ducts should be screened from adjacent sites, streets, and sidewalks.
- Building and roof design should minimize construction and maintenance costs.
- Building and room sizes should be designed to minimize long term operating and maintenance costs, and be of modest size for the type of unit proposed.

TOXICS ABATEMENT

- Rehabilitation projects must consider the abatement of hazardous materials such as asbestos and lead paint.
- Lead paint abatement may involve removal, encapsulation and/or maintenance education. Sites must be tested by qualified testing agencies before the construction contract bidding so abatement costs are covered in the budget.

ENERGY CONSERVATION

- Explore passive and/or active solar possibilities
- Investigate heating systems with life cycle efficiency such as heat pumps
- Provide insulation @ walls, ceilings, foundations, domestic hot water (ducts). Codes dictate minimum insulation, consider using more.
- Provide double glazed windows where possible
- At existing windows, provide and maintain proper weatherstripping
- Maximize natural light to decrease dependence on artificial lighting.
- Specify all water conservation devices including low flow shower heads; maintain plumbing fixtures and schedule regular replacement of washers to prevent leaking.

ACCESSIBILITY REQUIRED BY THE *BUILDING CODE*

COMMERCIAL:
- new construction: full accessibility
- existing bldgs: all areas of new construction and routes to the new construction area
  - accessible entry to bldg
  - path of travel to the new area
  - sanitary facilities (both genders)
  - telephone, water fountains
  - accessible parking stalls
  - signage (raised letters, braille)
  - lever hardware

RESIDENTIAL:
- new construction: as outlined inCA Multi-family Disabled Access Regulations
- existing buildings with no change of occupancy type: no accessibility upgrades required

ACCESSIBILITY WHICH *MAY* BE REQUIRED BY *FUNDING SOURCES*

COMMERCIAL: same requirements as building codes

RESIDENTIAL:
- ¥ 5% of units converted to full accessibility
- ¥ Accessible entry to bldg
- ¥ Path of travel to common areas
- ¥ Signage to common areas & unit rooms
- ¥ Lever hardware all common areas and wherever replaced elsewhere
- ¥ Public restrooms (if provided)
- ¥ Telephone, water fountains (if provided)
- ¥ Parking stalls (if provided)

REMEMBER: The codes dictate MINIMUM standards. Federal, Stare & Local affordable housing funding sources ***encourage*** accessibility. Discuss options and costs with funders to gain MAXIMUM accessibility.

Non mechanical solutions (ie: ramps) are much preferred over solutions which may break down or require the user to seek assistance (ie: lifts).

ACCESSIBILITY and FUNDING SOURCES

• Funding sources may influence how many accessible units must be provided. "Public" funding (possibly including grants from governmental sources), mandates more accessibility than "Private" funding (repayable loans).

• For privately funded projects refer to:
"CA Multi-family Disabled Access Regulations"
For publicly funded projects refer to:
"CA Accessibility Reference Manual"
(this distinction may be eliminated in the near future)

Other Codes which may apply include:
UFAS (UniformFederal Accessibility Stds)
Title 24

WHAT IF YOU CAN'T COMPLY?

• Provide an "**equivalent facilitation**" alternate

• Document the "**unreasonable hardship**"* which prevents full compliance and explain how the alternate provides equal access.
(see "Priority list" next page)

examples:

1. Main entry is several feet above street level without room for a ramp or a lift:: Provide access through a secondary entry. This entry must have all the ammenities of the main entry: signage, canopy, finishes, and allow arrival into the main area of the building.
2. Space constraint or level change prevents inclusion of accessible restroom within a tenant space: Provide access to another accessible restroomwithin the building (without requiring an unreasonable travel distance or a need to leave the building and re-enter by a public door unless these are also required of the able bodied user).
3. Space constraints prevent required space for front and side transfer to water closet. Provide either front OR side transfer space.

* "**Unreasonable Hardship**" may be **financial** (ie: expense of alteration) or **legal** (ie: Historic Preservation restrictions or building leases on adjacent spaces).

ACCESSIBILITY PERMIT PROCEDURES

(Procedures & costs for San Francisco shown)

• PRE-APPLICATION MEETING

• Request a Pre-application Meeting early in the schematic design phase to resolve all building and accessibility issues. (Meeting Charge: **$150).** Written and signed meeting notes of this pre-application meeting will be provided by Dept. of Bldg Insp. staff.
• Request that all departments are represented: Building Dept., Fire Dept. & Disabled Access
(Pre-application meetings are also available with the Planning Dept. for planning issues: a separate meeting with separate fees).
• Prepare an agenda and schematic plans to clearly identify the issues requiring staff interpretation.

• SUBMITTING PLANS

• To facilitate permit review, clearly indicate accessibility items on plans:
• entry: label as level or indicate % of slope
• doors: label dimensions of doors and of level landings both sides
• elevator: indicate dimensions in plan; show controls in elevation and indicate heights
• ramps: in section, show slope & handrails
• stairs: in section, show handrail height, extentions and stair run, riser dimensions in plan, dimension enclosures and landings
• restrooms: indicate 5 foot turning circle if required, also show clearances required at water closets, lavs and tubs. Indicate location of flush handles on water closets (these must be on the accessible side)

• NON COMPLIANCE MITIGATION PROCEDURES

If you cannot fully comply in some area, submit and "Unreasonable Hardship Request Form" with your permit application.
If the building dept. does not view your alternate as "equivalent" they will send you a check list of items to be changed. At this point you can:

1. Discuss the issue with the plan checker to identify acceptable alternatives.
2. Request a review with the Chief Building Inspector and the Disabled Access Division staff to for a second opinion on the issue (they have more latitude in what to accept)
3. Appeal the issue to the Access Appeals Commission (this adds expense and time delay to the project).

ACCESS APPEALS BOARD PROCEDURE
• Submit Application Form provided by Disabled Access Division
• Documentation must be submitted 19 days in advance of their hearing dates which are scheduled once a month
• Cost to submit: **$360**

• RENOVATION COST THRESHOLD FOR ACCESS REQUIREMENTS

Per the new 1995 UBC/ CA Building Code **section 1134B.2.1:** Renovations in *existing buildings* must provide the following accessible features:
entrance to builidng or facility; primary path of travel to area of alteration, seismic repair or addition; sanitary facilities; drinking fountain and public telephones serving the area.

EXCEPTION
If cost of renovation is under $80,710 (current threshold) and compliance with the code creates an unreasonable hardship, compliance shall be limited to the acutal work on the project. Unreasonable hardship exists where cost of compliance exceeds 20% of the cost of the project without the accessible features. In this case access shall be provided to the extent that it can be without incurring dis-proportionate cost. In choosing which elements to provide use the following **priority list:**

1. an accessible entrance
2. an accessible route to altered area
3. at least one accessible restroom for each sex
4. accessible telephones
5. accessible drinking fountains
6. when possible, additional elements

example: The cost of a renovation is $60,000 but the cost of altering the entry, the path of travel and providing accessible restrooms is $30,000. The cost of alterations is limited to $60,000 x 20% = $12,000.
cost of altering entry = $9000: required
cost of path of travel = $2000: required
cost of restrooms = $14,000: not required
required: all other alterations on priority list up to totalexpenditure of $12,000.

Consider art work or unique finishes at the entry to personalize the building and give users a sence of pride.

ENTRY

- Create an architectural "sense of entry" by using additional volumes, voids, canopies, threshold detailing, paving, etc.
- Make aplace that both feels and IS safe and secure.
- Circulation should be clear and obvious.
- Lighting--maximize natural daylighting.
- Provide floor mats at exterior building entrances, on both sides of the door.

CIRCULATION

- Accessible path of travel from entry is generally required.
- Minimize use and length of double-loaded corridors.
- Corridor amenities:
  - -Detail unit entries to define threshold and allow for personalization (eg. plant ledges, niche, seat to place groceries while opening entry door, etc.).
  - -Carpeting is discouraged due to cost and maintainenance difficulties.
- Vinyl tile flooring recommended for replacement ease.
- Provide windows or skylights to maximize daylighting
- Minimize length of corridors for safety and feeling secure.
- Minimize blind corners, niches or any hiding place.
- Avoid excessive square footage for circulation.
- A common play or recreation area is required in family projects, and group activity facilities are required for seniors.

RECREATION AREAS

- A common play or recreation area is required in family projects, and group activity facilities are required for seniors.
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BEDROOMS

• Place windows for best use of natural light.
Place closet and entry doors to allow two beds in a room if appropriate.

• Consider higher windows for more useable space below the window and greater privacy for residents. Note maximum height of sill above finish floor is 44" (for rescue purposes).

CLOSETS

• Adequate closet and general storage space should be provided for each living unit.
Consider larger-than-average family sizes.

• No walk-ins.

• Adequate closet space in all bedrooms.

• Pantry in kitchen for 3 or more bedroom units.

• Linen & coat closet must be provided for 2 or more bedroom units.

• Closet doors-- sliding recommended to alleviate swing space. Invest in high-quality hardware, bottom anchors

• No mirrors.u Closet doors-- sliding recommended to alleviate swing space. Invest in high-quality hardware, bottom anchors

• No mirrors.

• In larger units (2-4 bedrooms), linen, coat and pantry closets should not be sacrificed for larger bedroom closets.

• Fixed shelves vs adjustable**???**

KITCHEN/LIVING/DINING

• Arrange plan and windows for best use of natural light.

• Clearly delineate each area.

• A dropped soffit between the kitchen and living areas may serve to delineat each area and to contain grease vapors within the kitchen area.

• Plan: should the kitchen be open to the living area or arranged to clearly define the kitchen area**???**

BATHROOMS

- 1-2 bedrooms = 1 bath
- 3 bedrooms = 1-1/2 baths (in 2-level units, 1/2 bath on living/ kitchen floor).
- 4 bedrooms = 2 full baths (in 2-level units, one on each floor).
- Bathtubs are important for bathing children; use non-porous, non-scratchable tub and enclosure.
- Bathtubs should have slip resistant bottoms.
- Shower door with glide to prevent incorrect positioning of doors is preferred.
- Showerheads:
  - Use non-scalding type
  - 2-3/4 gpm (low flow type)
  - Flow shut-off showerhead for water conservation
- Flooring-minimally, use sheet vinyl, not vinyl composition tiles
- 1.5 gallon low-flush toilets.
- Water shut-off valve at unit.
- Accessible lever-type hardware throughout.
- Built-in soapdish.
- Towel bars--use sturdy metal kind and block adequately.
- Bathrobe hooks.
- Medicine cabinet -- quality, yet standard design.
- Lights over medicine cabinet -- single bulb or lamp with easy to replace cover.
- Fan--high cfm to cut mildew.
- Consider timer controlled switch for fan.
- Consider switching fan and light togeher to insure use of fan (although tenants will find ways to disconnect fans).
- Try to have window in bathroom for better light and ventilation.
- Shock protector outlets (GFI: ground fault interrupt receptacles) are required by code.

PROBLEMS REPORTED AT WALLS

• Unprotected corners are damaged by people and objects being moved

• Dirt and damage to walls is inevitable at entries and community rooms-extra protection is required. Initial cost of wainscot can be offset by maintenance costs.

ITEMS DISCUSSED

ELEVATOR LOBBY

• Provide benches for seating and to rest groceries on.

• Provide bulletin board for community messages

• Place a closet nearby for strollers, etc.

• A "walk-off" recessed doormat at entry is required; design it into the plan or management will be forced to provide a temporary one which will probably detract from lobby design.

• The high traffic areas at entry, elevator, mailboxes, manager's office and reception desk must be considered. Carpet is destroyed within months. The most durable floor finish will prove cost effective in life cycle costs.

• Make stairways pleasant and well lit. Carpet on stairs is also worn out quickly. Consider rubber treads, risers and landings.

• Provide storage areas and bins near manager's office for maintenance equipment, communal toys, etc.

• Provide safe and secure bike racks if appropriate.

• Provide an accessible pay phone for persons with disabilities.

SERVICES

• Place mailboxes within protected area, adjacent to entry, along primary path of circulation. Location of mailboxes should be coordinated with the U.S. Postal Service during design development.

• Security system should be located within protected area, sheltered from inclement conditions, and visible to visitors.

• Utility meters -- The location and accessibility of electrical, gas and water meters should be coordinated with the proper utility companies during design development. Electrical and mechanical equipment should be screened from vision.

• Trash--use durable materials on path of travel, including protective wall coverings.

MANAGER'S OFFICE

• Office space must be near entry, where manager can see who comes and goes.

• Manager's office must accomodate space for a desk, filing cabinet, and chairs for two visitors.

• Managers office must be hooked into the required security system, alarm system, and fire system. Connections should be coordinated with the appropriate agencies or departments during construction documents.

PROBLEMS REPORTED

ITEMS DISCUSSED

- Community rooms must be located for easy access by visitors and residents, and have views of common areas.
- Sound barrier/ insulation is required if room is adjacent to, above, or below living units.
- An accessible restroom adjacent to the community room is very desireable.

- Seating should allow for multiple groups to use the room without having to interact if they don't wish to.

- Locating mail boxes in an area with visual access to the community room allows tenants an excuse to "check out the action" in the room before deciding if they want to join whoever might be using it.

PROBLEMS REPORTED

- Countertops with burns, holes, delamination of plastic laminate
- Cabinets provided but not used by tenants because their possessions disappear.
- Inadequate lighting
- Grease stains and burn marks on walls and counters near the stove
- No place to set hot pans
- Appliance part (stove burner racks) stolen by tenants.
- Hoods provided at stoves, but not used by tenants.

ITEMS DISCUSSED

COMMUNITY KITCHENS

- Visual connection to common areas is desireable..
- Allow for use of kitchen as center of activity and circulation (get tenant input for good kitchen design).

- For San Francisco **code** requirements for community kitchens see San Francisco Building Code section 1205 which includes such items as:
  - -Only electric cooking appliances allowed
  - -Storage cabinets & countertops must be non combustable construction.
  - - One storage cabinet with 4 square feet of storage is required for every guest room.
  - -Entry door must be self closing.
  - -Minimum ceiling height to be 90" (7'-6")
  - -Floors shall be waterproofed
  - -At least one metal kitchen sink drainboard shall be provided.

- The kitchen must be accessible. The counter (including the sink) must be adjustable from 28" min to 36" max. unless the countertop is tile, granite or marble in which case it can be permanently set at 34" above finished floor. At least one compartment of the sink must be max 6" deep to allow leg room for seated user.
- Range hood controls must be with accessible reach.
- Don't bother to put in cabinets which are not assigned to individual tenants. They won't be used. (Would you leave any thing in a kitchen that would be available to others and expect it to be there when you wanted to use it again?)
- On the same note, don't spend funds on communal refrigerators. Invest in individual small refrigerators for tenant rooms where they can safely store their own food.

- Assume that anything not nailed down will be removed.

- Don't even THINK about plastic laminate as counter top material. They can be destroyed within weeks of installation.
- Stainless steel countertops have proven to be very durable and easy to maintain.
- Ceramic tile countertops are also recommended. However, particle board or plywood substrate is not recommended. Use mortar bed, "Durarock", "Wonderboard" (glass fiber mesh mortar unit) or equivalent.

PROBLEMS REPORTED AT BACKSPLASHES

- Stoves set against the wall with no hood: paint peeling from the adjacent wall and build up of dirt between the stove and the wall.
- grease build up at the walls and especially at the old vent pipe.
- *Metal or ceramic tiles at the wall approx 18" above the stove surface helped protect the wall but had similar grease build up.*

- Cabinets above the stove provide area for grease build up and varnished cabinets create a fire hazard.

- Grease build up at exposed pipes in the kitchen.
- *Recommend all pipes in kitchens be concealed.*

ITEMS DISCUSSED

UNIT KITCHENS

- The following features are recommended:
  - Pantry for units with 3-4 bedrooms.
  - Refrigerator-sized proportionally to unit size.
  - Garbage disposals. (some HDC"s feel these are a maintenance headache. Check with the staff who will manage the project).
  - Two-basin sinks (two large or one small and one large compartment)
- Single-lever faucets.
- Appliances:
  - No dishwashers
  - Four-burner ranges
  - In 3 or more bedroom units, include griddle with range
  - Self-cleaning ovens
  - Gas oven and range
  - High-quality range hoods (recirculating vent type is strongly discouraged)
  - In 3 or more bedroom units, 34-36" oven
  - Side by side refrigerator or one with freezer at the bottom to meet accessibility needs.

PROBLEMS REPORTED

CONDITIONS OBSERVED IN AN SRO RENOVATED 10 YEARS EARLIER

- Wall hung lavs pulled away from the walls (see plumbing fixture-lavs).
- Windows in bathrooms (opening onto a lightwell) located over the tubs which were converted to showers: water damage at window frame and wall below.
- Inadequate ventilation for shower.
- Tiles at tub surround buckling due to movement in walls.
- Patches to tile on walls and floors with different color tiles; grout lines not aligning.
- Water damage and mildew at ceiling-presumably from plumbing stacks above.
- Sprinkler pipes over the tub/ shower with heavy rust (also seen in newer installations).
- Sprinkler pipes used for hanging plants.
- Sprinkler heads painted over (therefore not functioning).

ITEMS DISCUSSED

COMMUNITY BATHROOMS

- Provide the heaviest duty fixtures and faucets
- Flush valve toilets have fewer breakable parts and allow easier cleaning of floors.
- Wall hung sinks must be installed with mounting brackets as specified by the manufacturer. Even this may not be enough. Ideally, wall and leg supports would be provided.
- People with psychological problems frequently vent their rage by damaging toilets. Some of this damage is unavoidable even with the best of management. Be realistic...have money in the maintenance budget for repairs or replacement. Make sure staff is aware of signs of problems.
- Consider motion activated exhaust fans to insure their use.

- Provide floor drains if at all possible.
- Make sure floor covering can stand up to excessive water: mortar set ceramic tile, concrete with epoxy coating work well.

- In housing located over ground floor commercial, leaking can cause costly damage especially if it occurs at night or on weekends.
- Providing heavy waterproofing underlayment of floors and floor drains with overflows diverted around commerical areas will be well worth the money.
- Accessible toilets, sinks, showers and accessories are generally required on all floors even if there are no accessible units on that floor. Exceptions may be made for existing buildings, but if renovation is extensive and the floor can be reached by elevator (even if not fully accessibe compliant) accessible facilities may be required. Check with the local building department.

UNIT BATHROOMS

- Provide proper ventilation! This is the major cause of damages to finishes.
- Provide the quietest fan possible. Noisy fans will go unused or be disconnected.
- Natural ventilation is preferred; even then, mechanical vents may be required.
- Provide the largest possible fan and make sure it has an adequate area in which to vent. The small lightwells in many older residential hotels are inadequatae for venting the bathrooms. A large fan at the top of the lightwell may be required to assist in drawing out moisture.

PROBLEMS REPORTED

• Lavs in rooms are used as toilets: lavs come off the wall and adjacent wall and floor surfaces are maintenance problems.

• A pattern of dirt develops at the entry to the room or apartments.

• Lavs: Wall hung types come off the wall; cabinets below the lav hide leaking pipes which creates additional damage to the cabinet and surrounding finishes.

"regardless of the color scheme, whenever I repaint a unit room, I paint the whole room-trim and walls- antique white semi gloss"
maintenance staff

ITEMS DISCUSSED

• Wall surfaces around the lavs within the unit should be protected with a water resistant wall covering like thermoplastic or fiberglass.

• Lavs supported by open legss were preferred. If this type of sink is used, care should be taken to make the legs wide enough (30") to comply with accessibility requirements.

• Flooring at the entry door and at lavs shoud be hard surface, water resistant type like sheet vinyl instead of carpet.

• Room hardware should be commercial grade, lever type on all doors.

• Some maintenance staff and tenants prefer hard surface flooring like sheet vinyl, linoleum, VCT or hardwood rather than carpet as they believe it is more sanitary and can be cleaned without a vacuum cleaner.

LAUNDRY ROOMS

PROBLEMS REPORTED

- Laundry rooms are often squeezed into leftover space (next to the boiler room).
- Accessories are overlooked: folding tables, utility sinks.
- Machines overflow and damage flooring materials. Chemicals used in cleaning products add to damage to finish materials.
- Inadequate ventilation causes excess dampness and damage to materials and an unpleasant environment for tenants.
- Counters provided for folding clothes are used as benches and are torn loose from the wall.

ITEMS DISCUSSED

- Locate laundry rooms next to courtyard (or any open space) to make the space lighter and more pleasant. If appropriate provide space where kids could play while parents do laundry.
- **Always** specify a floor drain and adequate floor slope to assure drainage.
- Provide tables for folding clothes (always requested by tenants). Provide sturdy legs to support .
- Provide adequate and comfortable seating.
- Provide utility sinks (mgmt reports this is the most asked for item by tenants). Min. 30" x 24" x 18" deep

- Provide adequate ventilation-preferably an operable window.
- Walls should be painted with semi gloss or gloss; protective wall coverings are not required.

- Floors: 12"x12" VCT does NOT hold up. Flooring should be a continuous membrane with integral cove. Solutions suggested:
  - -Quarry tile over wonderboard or mortar set-use 6"x6" or smaller to prevent cracking
  - -Sheet vinyl
  - -Concrete with epoxy resin
  - -Epoxy flooring
  - -Dex-o-tex over concrete
- Any flooring must be able to withstand bleach & soap spills.
- A three-sided trough around the laundry machines with drainage to the floor drain can be used to prevent water damage to the rest of the floor. A metal pan with a 1" drain can serve the same purpose.

- Provide a minimum of one washer & dryer set for each ten units (more if family housing). Coordinate type, dimension, utility and other requirements with equipment leasing agent.
- 1 washer & 1 dryer must be accessible (front load washer).
- Specify gas dryers only.

- Acoustic isolation is desireable and required by code for walls or ceilings common with residential use.
- Code requires that laundry rooms be separated from other construction by one hour rated walls, including one hour rated door and window assemblies. This more restrictive regulation means doors and frames must be steel, and it restricts the amount of glass in a door to 100 sq. inches (10" x 10"). Windows into the room cannot be greater than 25% of the wall surface and must have wire glass.
- The rated door will require a closer. If having the doors open is desireable (to connect to a play area), consider using magnetic automatic hold open devices which release the doors in case of fire. (Otherwise the doors will be manually propped open and not provide protection when need)

- Keep the laundry room locked with key access by tenants.

PROBLEMS REPORTED

- Doors to trash chutes are too small; garbage spills over the sides damaging walls and floors.
- People set down their garbage to open the door to the trash room, soiling the carpet outside the trash room.
- Trash room is too far from tenants and there is a trail of stains leading to it.
- The trash room is hard to clean and smells.
- Trash chutes get plugged at any bend in the chute and become unusable.

ITEMS DISCUSSED

- Flooring: No carpet in trash rooms! Flooring must be continuous membrane. Hard flooring should extend into the area in front of the door to the trash room.
- Specify floor drain and a hose bibb with hot and cold water. The hose bibb should be the recessed type, accessible to maintenance staff only. (surface accessible hose bibbs with removable handles are tampered with by the tenants using plyers which also strips the fixture making it unusable by the maintenance handle
- Specify doors to the chute as large as possible.
- Consider a cleanable shelf or bench adjacent to the door to the trash room for tenants to set the garbage while opening the door. (By code there must be a fire rated door separating the trash chute/room from the corridor).
- Specify protective wall covering around the trash chute door. Finishes suggested include fiberglass over plywood. Epoxy paint should also be considered.
- Best wall covering is sheet metal up to a minimum of 3 feet above the floor. Better to extent it to the ceiling. (Trash terminiation rooms-where bins are stored-require full sheet metal lining at walls and ceiling)
- For pest control, the trash room must be sealed and all seams thoroughly caulked.
- Property management must include trash room in routine pest control program.
- Doors to trash room should have a view panel and the door itself should have protective finish especially on the trash room side.
- Chutes are vastly preferred to trash bins for convenience and pest control. Trash termination is best in an enclosed room, not an open container.
- Adequate ventilation is imperative. Consider a 24 hour fan, or one on a timer for daytime operation.
- Finding a place for a trash chute in an existing building can be problematic. Chutes located off fire escapes can provide a solution and offer the advantage of open ventilation
- Lighting is best continually on, or on a timer activated by the opening of the door, set to turn off in a set amount of time.
- Sound insulation around the trash chute and trash room is necessary to minimize tenant complaints. Minimally, two layers of gyp board with batt insulation should surround the chute and the room. Best solution is to provide a sound cavity-an air space between layers of finish materials.

IPROBLEMS REPORTED

- Tenants steal from open bins.

- Incentive must be given for recycling or it is a waste of time.

ITEMS DISCUSSED

- Recycling:

-It is unrealistic to expect people in small rooms or units to sort trash for recycling. Bins at the ground floor only have gone unused.
-Ideally, there would be chutes for each type of recycling. Tenants steal from open bins.
-Management must provide periodic education sessions for recycling as even tenants in market rate housing can't seem to understand what is recycable.
-Collections stations on each floor is a possibility, but only if management has a plan for tiemly removal of recycables.

- Compactors

-Compactors can reduce the volumn of trash to be picked up by scavenger company and may therefore reduce operating expenses.
-Route from compacted trash bin to street must be virtually level as compacted trash is too heavy to lift or push uphill.
-Compactors will discourage separation of trash (recycling) and therefore not be desireable.

JANITOR CLOSETS

PROBLEMS REPORTED

• Janitor closets are located off of hallways which require a rated door and door closer. To work in the closet, the janitor has to prop open the door (with a mop that stains the hall floor). *Consider providing a magnetic hold open devise at the closet door which will hold the door open when necessary but release in case of fire.*

• Making it easier for the janitor to do a good job will pay off for management.

• Provide an information area on the trash room door, or a mailbox or slot in the door, so repair requests can be communicated to staff.

ITEMS DISCUSSED

• The best location for the jan. cl. is where it is most accessible to areas of the building requiring the greatest amount of housekeeping: kitchens, lobbies.

• A small closet supplied with vacuum and mop for quick clean ups should be located in the lobby area, separate from the janitors equipment/supply room.

• Janitors require storage space for supplies in lockable cabinets and a desk or work table somewhere in the building. Janitor closets on individual floors should be able to accommodate some storage and enough space for the janitor to be in the room with the door closed (but not enough space to lay down and sleep).

• What should the janitors closet accommodate?

mop/wringer
paper products (3 cases)
electrical supplies
rack for brooms, mops, vacuum
shampoo & floor care machines
signs for "WET FLOOR"
safety ware (hardhat, rain suit, coats)
waste basket *and* one 32 gal trash can
mirror, dispensers for hand washing.....towels, soap.

• What type of shelving/storage?

Shelves for storage (located high enough to allow for storage of cases of paper products)
drying rack above sink for wet rags

• The main maintenance inventory should be stocked in one central location so that it can be accounted for. Ideally, the janitor has a cart with frequently used items (light bulbls, toilet paper). If not, a limited supply of these can be accommodated in the individual floor janitor closets. (These items will disappear if they are not adequately secured). Designers should interview maintenance staff to determine method of cleaning.

• Lighting and adequate ventilation must be provided. The chemicals used in cleaning products require good ventilation.uWall covering:fiberglass-reinforced or plastic wallcoverings work well.

• Flooring: Quarry tile or other unglazed tile, with high base board and good slope to a floor drain.

• Flooring adjacent to the closet should also be durable as water and concentrated solvents are spilled here.

• Floor sinks work best; they require less lifting for the janitor. Ideally, there would be both a floor and a wall hung sink to accommodate different types of maintenance.

• Floor Drain: provide one! locate it well away from entry door to room. If the door must be kept open for the janitor to use the room, provide the door with a magnetic hold open device tied to building fire alarm so it can stay open for use, but will close in case of fire.

• Door frames should be steel, doors should be solid core with a heavy duty lock.

• FLOORS

1. MARBLE/GRANITE	1. This is the preferred choice for high traffic entrance and elevator lobbies. Its incredible durability can justify the high initial cost, especially in limited areas.
2. RESILIENT TERRAZO TILES	2. With marble chips in a matrix, these tiles are more durable than vinyl composition tile but cheaper than solid marble.
3. HARDWOOD FLOORS or WOOD TILES	3.Hardwood flooring is an acceptable alternative for low to medium traffic lobbies. If hardwood or wood subfloors exist, it makes good sense to refinish them. Application and maintaenance of a protective coating is mandatory.
4. CERAMIC TILE, QUARRY TILE	4. Mortar set tile provides a durable and attractive surface but is succeptable to cracking if subjected to heavy rolling carts or objects dropped (furniture moving).
5. VINYL COMPOSITION TILE	5. When properly maintained by trained staff, VCT offers a durable surface at a reasonable price, and damaged areas can be selectively replaced.
6 CARPET	6. Usually the first choice for initial cost considerations, carpet is the last choice for durability in high traffice areas. Talk to any maintenance person before considering this material in a high traffic area. (An area rug or inset carpet in the seating area of the lobby is a viable alternative.)

• WALLS

1. STONE OR TILE WAINSCOTTING	1. Durable and easy to clean, protects wall at vulnerable areas. Use to 4 feet above floor or taller if appropriate.
2. WOOD WAINSCOTTING	2. Protects walls against fingerprints, scuffs & nicks. Stained wood hides damage better than painted.
3. STUCCO	3. At entry lobbies, smooth cement stucco can be a reasonably priced alternative, especially in older buildings, to protect existing walls or cover existing cracks.

• CEILINGS

1. PLASTER OR GYPSUM BOARD	1. Preferred in all cases over acoustical ceiling tiles.

• TRIM

High wood baseboards, chair-rails, wainscotting & cornerguards, help protect walls against normal wear & tear and furniture moving.

• FLOORS

1. HARDWOOD FLOORS	1. Hardwood floors are durable and can be repaired as opposed to replaced after many years of use. They stand up well to stains and spills and if properly maintained can last 50 plus years.
2. LINOLEUM	2. Linoleum is a durable, natural product that stands up to spills, stains and even burns. The color is solid throughout. Maintenance by trained staff keeps the product looking its best.
3. VINYL COMPOSITION TILE	3. VCT is semi-durable, easy to maintain and cost effective, it also requires proper maintenance by trained staff.
4. CARPET	4. The primary advantages of carpet are its low noise transmission, warmth and initial cost. Durability depents on type of carpet chosen. Again, proper maintenance will effect life cycle effectiveness.
5. CARPET TILE	5. Carpet tile offers selective replacement in high use areas as the trade off for its initial higher cost. Care must be taken to order sufficient overage in initial order to have replacement tiles of the the same dye lot as the original.

• WALLS

1. PLASTER/GYPSUM BOARD WITH WAINSCOTING	1. Wainscotting or chair rail provides extra protection and level of design to hallways.
2. PLASTER/GYPSUM BOARD	

• LIGHTING

It is important to assure sufficient light in the hallways where everyone must pass on a daily basis. Fluorescent lighting should be used for energy consumption effeciency, but can be supplimented at special areas with warmer, incandescent lighting such as wall sconces.

• FLOORS

1. HARDWOOD	1. Hardwood floors are a preferred alternative because they are easy to maintain and very durable in medium to low traffic areas. If they are existing it makes good economic sense to refinish them.
2. LINOLEUM	2. Linoleum is a very durable, natural and attractive flooring product. It comes in a wide variety of colors and is resistant to spills, stains & burns.
3. RESILIENT TERRAZO TILE	3. Resilient terrazo tile is a very durable product available in the color range of the marble chips which make up the matrix.
4. VINYL COMPOSITION TILE	4. VCT is semi durable, easy to maintain and can be selectively replaced if damaged. The wide variety of colors and textures can be combined to create interesting designs or to define separate areas.
5. CARPET	5. The primary advantages of carpet is low noise transmission, warmth, and low initial cost. As an overall floor covering it is succeptable to staining and frequent cleaning and/or replacement should be included in the maintenance budget. Consider area carpets used with other type of flooring above, but remember ADA requirements for level flooring to avoid tripping hazards.

• WALLS

1. WAINSCOTING	1. Wainscoting made of wood, tile, marble, glass reinforced fiber board or even heavy duty wall covering is preferred to help protect walls against children playing, or other daily wear.
• TRIM	In combination with wainscoting, or if wainscoting is economically unfeasible, high baseboards, chair rails and cornerguards can help protect walls and add architectural interest.
• LIGHTING	A well lit and inviting environment is important in the community room. A variety of lighting should be provided to suit the various functions of the room: bright for meetings, more subdued for daily use. Some options would be: soffitted fluorescents which provide up and down lighting; wall sconces, fluorescent pendant fixtures or ceiling mounted fluorescents. In renovation projects it is important to be sensitive to the character of the original details in choosing fixtures.

Table of Contents

MATERIALS

FORMAT [Organization of information on the page]

1. MATERIAL

2. COST PER SQUARE FOOT (MATERIALS AND INSTALLATION)
Prices are based on the "1990 Mean's Repair and Remodeling Cost Data" and include materials and installation.

3. PREFERRED LOCATION(S) FOR USAGE.
In individual sections, there will be a graph with recommendations on the appropriate use of materials that will be like the following:

- ○ KITCHENS
- ○ COMMUNITY KITCHEN
- ● BATHROOMS
- ● COMMUNITY BATHROOMS
- ○ LOBBIES
- ○ HALLWAYS
- ○ COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ◘ OFFICES
- ◘ LAUNDRY ROOMS
- ○ TRASH ROOMS

- ● PREFERRED
- ○ ACCEPTABLE
- ◘ NOT ACCEPTABLE/NOT APPLICABLE

4. BRANDS
The Manufacturers listed are for informational use only. This list is not an endorsement or recommendation of the manufacturer.

5. DESCRIPTION
Description and recommendations for best application and installation.

6. ADVANTAGES(✓) / DISADVANTAGES(X) / ITEMS DISCUSSED (◆)
Lists pros and cons of the product, as well as any additional comments.

7. COMMENTS

8. SPECIFICATIONS
Lists suggestions to follow when installing the product.

SPECIFICATIONS

1. SHEATHING

- Plywood sheathing or other acceptable subflooring materials shall be fabricated with waterproof (exterior) glue. Floor sheathing shall be glued and nailed with the longest joint of each panel perpendicular to the floor joists. Where floor joists are 16" on center, use minimum 5/8", 3/4" recommended, tongue and groove plywood and install in a staggered pattern so that no two adjacent panels have a joint falling between the same two floor joists. Joists 24" on center shall use 3/4" tongue and groove plywood. Joists on 32" girder system shall use 1-1/8" tongue and groove plywood.
- Exterior grade plywood must be used for all exterior sheathing.

2. STRUCTURAL WOOD GENERAL

- Each piece of lumber and plywood shall be graded and marked with the grade and trade mark of a recognized lumber grading association or an independent inspection agency authorized by the American Lumber Standards Committee to grade the specie. Reference standards shall be from authorized grading agencies as follows:
- Grading of Douglas Fir, Spruce, Hemlock, and Red Cedar shall be governed by West Coast Lumberman's Bureau rules number 16, latest revised edition, and voluntary products standard PS-20-70.
- Grades and specifications of the California Redwood Association shall apply to the use of redwood products.
- Softwood plywood grading rules shall follow American Plywood Association PS-1 latest edition, or U.S. Product Standards PS-1-74; Hardwood Plywood Product Standard PS-51-71; Plywood siding APA 303 siding - NL- W Ext.
- Particle Board shall have APA or TECO grademark.
- Wood truss roof systems shall be engineered.

ADVANTAGES(✓) / DISADVANTAGES(X) / ITEMS DISCUSSED (◆)

◆ Low end photo overlay finishes do not hold up; they are a waste of money

◆ Varnished cabinets over stove pose a fire hazard; varnish is very flammable

◆ Cabinets with a laquer finish need a protective coating, such as wax, applied periodically to protect the finish.

◆ Countertops:
- Plastic laminate is recommended - not a light color.
- Integral coved splashboard and integral post-formed drip guard.

◆ Cabinets:
- Minimize hardware
- Melamine or other laminate with wood trim and integral finger pulls @ drawers & doors (dado)

SPECIFICATIONS

1. MILLWORK

- Baseboards or floor moldings must be provided in all rooms and closets. Wood base moldings must be 2-1/2" minimum in height; vinyl base must be 4" minimum in height.
- Finger jointed, economy grade lumber is recommended for wood door, wood sill and floor moldings.

2. CASEWORK GENERAL

- Provide for adequate backing in stud walls for attachment of casework.
- Wood shelving shall be self edged 3/4" industrial grade particle board, minimum 45 pound density or 3/4" plywood with edge bands. All shelving shall be securely supported every 32" to prevent sagging. Shelf pole brackets shall be triangular metal supports. Other closet storage systems will be considered. Clothes poles to be 1-3/8" diameter full round.

3. CASEWORK/CABINET

a. MINIMUM STANDARDS AND MATERIALS:

- Sides exposed: hardwood plywood with birch, oak or ash veneer.
- Sides unexposed: 3/4" MDF or plywood.
- Backs: on upper cabinets, 1/4"hardboard or plywood.
- Back bands: 3/4" x 2-3/4" solid pine or other acceptable wood.
- Bottom shelf: 3/4" MDF or plywood
- Intermediate shelves: edge-faced 3/4" particle board. (If shelving is adjustable and over 36" span, apply stiffener to shelf face).
- Face frame: 3/4" hardwood to match plywood veneer (birch, oak, ash or alder).
- Door fronts: 3/4" hardwood plywood or hollow core hardwood framed with birch, oak, ash veneer.
- Drawer fronts: 3/4" hardwood matching the hardwood

plywood veneer (birch, oak, ash veneer).
- Drawer sides: 7/16" hardwood or HDF or 1/2" plywood.
- Drawer backs: 3/4" hardwood, fir, plywood, or particle board.
- Drawer bottoms: 1/4" hardboard or plywood.
- Breadboards: solid hardwood - rabbeted.
- Toe base: standard mitered finish end, sized to accommodate vinyl base.

b. FABRICATION
- Face frames: joints doweled and glued, or screw assembly. Screw assembly is glued and clamped with hydraulic clamp and screwed from back at 45 degree angle. Corrugated staples prohibited.
- Joints: glued and nailed, or screwed
- Drawer bottoms: dadoed into sides.
- Drawer fronts: dadoed and glued into sides with self locking joint or rabbeted and glued with sides nailed by hand or gunned 'T' nailed or stapled.
- Back bands: cabinets must be attached to walls with screws.
- Finish: all visible, exterior and interior, surfaces shall receive sealer, stain and finish coats.
- Cutouts: apply waterproof sealer to exposed edge and 6" back of all sink and lavatory cutouts in countertops.

c. HARDWARE
- Drawer guides: shall be side mounted (on each side of drawer) metal side glides with nylon ball bearing rollers having a 75 (125) pound capacity (K.V., Grant, or similar quality product)
- Drawer and door pulls: not recommended; use integral recessed finger pulls.
- Recommended earthquake safety measures include friction or magnetic "positive" latching for all cabinet doors and 1-1/2" retaining lip @ shelving.

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

◆ Hire a waterproofing specialist as part of the design team to create details and have them do inspections during construction.
◆ Site preparation is as important as the roofing system. Examine the roofing slope, penetrations, downspouts etc before application of new roof.
◆ In rehab jobs, examine roof framing after removal of the existing roof and replace any damaged framing, blocking, or sheathing and correct drainage slope.
◆ No roofing system can be expected to last forever. Typically, the roof will need replacing during the life of the loan. Provision must be made in the maintenance budget to replace the roof at reasonable intervals.
◆ Routine inspection of the roof should be part of maintenance schedule. Unplugging clogged drains can prevent problems before they cause leaks.
◆ Water tests must be made during the application of the roofing. They should be done after application of the first ply to determine if adequate slope for drainage has been achieved. If there is a problem, it can be remedied before application of other layers of roofing. Frequently the water test is not done until the final layer is complete when modification to slope is more difficult.
◆ Leaking due to poor waterproofing details rather than roofing system itself
◆ Improper roof framing causes low spots or inadequate slope for drainage
◆ All roofing guarantees from manufacturers depend on "proper installation" which is difficult to determine by a lay person.

SPECIFICATIONS

- All roofing materials must be installed in compliance with the American Society for Testing and Material Standards, with a three year guarantee by the roofing contractor. The guarantee shall cover all repairs caused by failure of the roofing materials, faulty workmanship or any other causes attributable to all roof related work and materials furnished and installed by the contractor, at no cost to the owner, for a period of three years after the initial acceptance of installation. Inadequate conditions of surface to be roofed shall not be the cause for contractor to be absolved of responsibility to perform.
- Shingle roofing must carry three year subcontractor guarantee and 20 year manufacturer's warranty. Shingles should be three-tab, self-sealing, 235-pound minimum, class A asphalt -fiberglass shingles with 200% coverage. Flashing and gravel stops on structures of three stories or more should be aluminum or 24 gauge galvanized sheet metal.

SPECIFICATIONS

1. WATERPROOFING

- Damprooofing for slab on grade is to be provided as per soils report. (Soils report is required to have been completed within the past two years). The minimum recommended damproofing is 6 mil. polyethylene sheeting with a base course of 2" sand cover over 4" crushed rock.
- Provide for adequate drainage at below grade walls and foundations.
- Waterproofing of slabs at parking structures is required to prevent alkali from dripping onto cars.

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

◆ As with roofing, hire a waterproofing specialist as part of the design team to create details and have them do inspections during construction.

◆ Installation is the key to any exterior siding system. Warrantees and guarantees are only as good as the contractor who installs.

◆ Caulking exposed to sunlight will decompose over time. Detail to cover caulking.

◆ Graffiti resistant paints are available for exterior siding.

1. Exterior Insulation Finish Systems (EIFS)
DESCRIPTION Composit insulation and cementitious overcoat siding system.
- "Dryvit" and other brands

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED (◆)
-The one coat system is not considered good.
-Leaks are difficult to trace; water can penetrate many floors before being noticed.
-System isnot very secure (a hole can be punched throught the panel quite easily.
-System should only be used above first story to avoid damage both at street elevations and in courtyards.
-Problems occur at connections at windows; bituthane can be used with stucco or wood siding, but not with EIFS. The system is rarely tight to the window and the paper behind usually has penetrations.
-Problems also occur caulk joints. Stucco systems also have problems at caulk joints, but have fewer joints.

2. Stone: marble/granite:
DESCRIPTION Broken or cut rock used as structural orface material

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED (◆)
-Expensive but longest lasting
-Polished stone is the most expensive, but longest wearing finish product and proves cost effective especially in high density areas.

3. Wood Siding:
DESCRIPTION Wood boards or panels applied vertically or horizontally.

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED (◆)
-Handsome but expensive, appropriate for lower density residential
-Requires routine maintenance of painting for water protection.

4. Composition wood siding:
DESCRIPTION

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED (◆)
- Inexpensive but requires proper detailing and maintenance
-Masonite board available in 16" sections
-Fiberboard is available molded in various shapes and preprimed.
-Oriented Strand Board (OSB) is available in exterior grade as underlayment
-Plywood simulated board siding (ie. T-111) can be cost effective, but should be detailed to cover joints as this is the area of water infiltration.

5. Vinyl Siding

DESCRIPTION

ADVANTAGES(✔) / DISADVANTAGES(✘) / ITEMS DISCUSSED (◆)

6 Corrigated metal:

DESCRIPTION

ADVANTAGES(✔) / DISADVANTAGES(✘) / ITEMS DISCUSSED (◆)

Appropriate only where industrial look is acceptable, probably not in housing

DESCRIPTION

ADVANTAGES(✔) / DISADVANTAGES(✘) / ITEMS DISCUSSED (◆)

7. Cementatious products

DESCRIPTION

ADVANTAGES(✔) / DISADVANTAGES(✘) / ITEMS DISCUSSED (◆)

These are an improvement over wood products and also labor saving.

8. Brick

DESCRIPTION Fired clay masonry units

ADVANTAGES(✔) / DISADVANTAGES(✘) / ITEMS DISCUSSED (◆)

ADVANTAGES(✓) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

◆ Provide the best doors that can be provided. They take a lot of abuse.

Exterior Doors.....
-Exterior building doors minimum requirements: solid core, paint or stain grade, metal clad or hardwood faces, with a standard one year guarantee and all six faces factory primed.

Interior doors.....
- Unit entrance doors minimum requirements: solid core, paint or stain grade, metal clad or hardwood faces,with viewers
-Although metal doors do not have a residential "feel" they are preferred by some users because of added security.
- Unit interior doors: solid core preferred as they can be repaired. Hollow core acceptable in light use residential only. Doors should be prefinished or prime coated for enamel on all six sides. Hardboard faces or wood veneers on prefinished interior built-up-doors must be a minimum of 1/8 inch thick. Decorative laminate faces are unacceptable.

Hardware.....
- All new door handles must be lever type. Spherical doorknobs are not acceptable unless existing in good condition.
-Lever hardware on a rated door require a 10" style to have sufficient wood mass for fire rating.

-Rated doors require closers. Consider rated self closing hinges rather than door closers which are often damaged by people hanging on them or using them as storage hooks.

- Manual door chimes are acceptable.
-Door viewers are generally set at 60" above the floor .....consider your population.....60" may be too high for elderly or Asian populations.

Code dictates the amount of glass permitted in rated doors. Laundry room doors are required to be 60 min. rated which limits glass to 100 sq. inches of wire glass per door.

- Exterior doors must have weatherstripping. Design exterior door sills to prevent infiltration of wind blown or standing water from building exterior.
- All exterior finish hardware should be stainless steel,or aluminum and conform to exterior doors and frames.
- Bathroom privacy lock shall have emergency key furnished for each bathroom.
- Interior door stops must beprovided using spring type, those screwed to door or wood base, or steel plated rubber wall type.

SPECIFICATIONS

- Verify the use of the following provisions, or hardware:
    - security controls at exterior doors
    - keying of locksets (grandmaster, master, submaster, etc.)
    - kickplates

- Require contractor to provide construction locks and keys for security of construction site, and the building upon completion of the building envelope.

$

- ● KITCHENS
- ● COMMUNITY KITCHENS
- ◘ BATHROOMS
- ◘ COMMUNITY BATHROOMS
- ○ LOBBIES
- ○ HALLWAYS
- ◘ COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ◘ OFFICES
- ● LAUNDRY ROOMS
- ● TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- Preferred for laundry rooms, community kitchens, building entry doors

BRANDS

DESCRIPTION

1. GENERAL

Metal doors are composite construction with metalface material over stiffeners or a mineral core. They are available fire rated or non rated, flush or panel construction.

2. HOLLOW METAL DOORS WITH VISION PANELS

- Hollow metal doors can incorporate vision panels of clear or wire glass.
- They are heavier construction than aluminum and the metal can be repaired more easily than aluminum if damaged.
- They can be fire rated: size of glazing is limited by the fire rating required including:

1 1/2 hour	100 sq. in. max
3/4 hour	1296 sq. in. (54" x 24")

ADVANTAGES(✔) / DISADVANTAGES(✕) / ITEMS DISCUSSED(◆)

✔ Dents in metal doors can be repaired with Bondo? similar to repairs in car bodies.
✔ More difficult to break than wood doors
✕ Major dents will require replacement of entire door
◆ Although not residential in feel, metal doors are preferred by some tenants as entry or unit room doors because of the security they provide
◆ Exterior out-swinging doors with vision panels need protection, especially at header. Without protection, water tracks back on header and down back and sides of door.
◆ Vision panels - for security, exterior moldings on exterior doors should be welded into the door and all exposed fasteners should be tamper-proof.

SPECIFICATIONS

- Hollow metal doors are usually installed with metal frames, although wood frames and trim can be used in non-rated conditions.
- Rated assemblies generally require metal frames.
- Hollow metal doors are available in various steel gauges according to use and security needs.
- Hollow metal doors should receive at least one shop coat of rust inhibitive primer before delivery to job site.
- Make sure hinges are of adequate strength.

$

- ● KITCHENS
- ● COMMUNITY KITCHENS
- ◘ BATHROOMS
- ◘ COMMUNITY BATHROOMS
- ● LOBBIES
- ○ HALLWAYS
- ● COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ● OFFICES
- ● LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- Hindged glass aluminum doors are preferred for storefronts or non-rated entry doors requiring visibility.

BRANDS

DESCRIPTION

1. GENERAL

Glass doors combine glass panes with aluminum, steel or wood frames. They are used where vision and physical access are required, in commercial and residential applications.

Aluminum framed glass doors are used in commercial storefronts and sliding glass patio doors.

Wood frame with single or multi pane glass are used mainly in residential. Heavier use applications require hollow metal frames.

2. HINGED GLASS ALUMINUM DOORS

Hinged glass aluminum doors are most frequently used in commercial storefront applications. They are available anodized or in a variety of prefinished colors.

3. SLIDING DOORS

Sliding glass doors with aluminum frames are frequently used in apartment or single family construction because they provide a large area of glass, for light and air, and are inexpensive. Sliding glass steel frames have the same advantages, are sturdier than aluminum, but are more costly.

ADVANTAGES(✔) / DISADVANTAGES(✕) / ITEMS DISCUSSED(◆)

SLIDING DOORS

◆ Glass in these doors must be tempered to prevent injury to people or pets walking into them. Security is a particular concern.
◆ They should not be used in susceptible locations.
◆ The locking devices should include a vertical rod, or lever bolts, at top and bottom; the frame should be solid or reinforced at the locking points.
◆ The operating panels should be designed so that they cannot be lifted out of their tracks when in the locked position.

SPECIFICATIONS

$

- ● KITCHENS
- ● COMMUNITY KITCHENS
- ● BATHROOMS
- ● COMMUNITY BATHROOMS
- ○ LOBBIES
- ○ HALLWAYS
- ○ COMMUNITY ROOMS
- ○ UNIT ROOMS
- ○ OFFICES
- ○ LAUNDRY ROOMS
- ○ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- Preferred for unit entry and room entry.

BRANDS

DESCRIPTION

1. GENERAL

Wood doors can be solid core or hollow core. Wood doors are available in a variety of panel configurations, or flush. Panel or solid core flush doors can incorporate glass inserts.

2. SOLID CORE WOOD DOORS

Solid core doors are either all wood throughout or have a core of composit construction which is solid throughout. Solid core wood doors are available with 20 minute fire rating.

3. HOLLOW CORE WOOD DOORS

Hollow core wood doors have the wood face material separated by strips of corregated cardboard.

4. LAMINATE HOLLOW CORE DOORS

High pressure laminate hollow core doors are similar to wood faced hollow core doors, but have a hard, smooth prefinished surface. They are inexpensive, but difficult to repair if damaged. They are not available with fire rating.

5. SIMULATED WOOD HOLLOW CORE DOORS

Simulated wood hollow core doors have embossed masonite face finish fabricated to resemble wood.

ADVANTAGES(✔) / DISADVANTAGES(✗) / ITEMS DISCUSSED (◆)

SOLID CORE WOOD DOORS

✔ Nicks and dents in solid wood doors can be repaired with wood putty by maintenance staff.

HOLLOW CORE WOOD DOORS

✔ They are inexpensive

✗ They are acceptable only for light residential use.

✗ Hollow core wood doors are not available with fire rating.

✗ Easily damaged, cannot be used in medium to high use areas.

SIMULATED WOOD HOLLOW CORE DOORS

✔ They are prefinished and inexpensive

✗ They are not repairable and must therefore be replaced if damaged.

◆ From both a maintenance and appearance point of view they should be avoided.

SPECIFICATIONS

ADVANTAGES(✔) / DISADVANTAGES(✕) / ITEMS DISCUSSED (◆)

Renovation:
- A frequent harmful location of lead paint is at windows (damaged paint, friction surfaces). Removing the existing wood windows and replacing them with similar style double grazed windows solves both lead paint and weatherization issues.
-On historic buildings the replacement of windows will be an important decision. Replacement "in kind" (replacing existing wood with new wood, not vinyl or metal) will be required. Replacement with inappropriate materials may affect funding and jeopardize the project.
-if unusual or decorative window is to be repaired, off site stripping of the lead paint is recommended to avoid lead contamination at the site.

New Construction:
◆ All aluminum windows or sliding glass door shall have a clear anodized finish: mill finish is not acceptable.
◆Windows should be factory stock sizes. Each pane of glass shall bear a label showing the manufacturer's name, quality and type of glass.
◆Double-hung windows recommended for family units
◆Use of glass or glazing to conform with state safety glazing regulations.

$

■/○ KITCHENS
■/○ COMMUNITY KITCHENS
■/○ BATHROOMS
■/○ COMMUNITY BATHROOMS
■/○ LOBBIES
■/○ HALLWAYS
■/○ COMMUNITY ROOMS
■○ UNIT ROOMS
○/○ OFFICES
○/○ LAUNDRY ROOMS
■/○ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
■ NOT ACCEPTABLE/NOT APPLICABLE

BRANDS

SUSPENDED LAY-IN ACOUSTICAL CEILINGS

DESCRIPTION Supsended lay-in ceilings are prefabricated panels layen in or attached to a grid system of metal runners with are hung from the building structure.

ADVANTAGES(✔) / DISADVANTAGES(✕) / ITEMS DISCUSSED(◆)

✔ Easy access to utilities above ceiling
✔ Economical
✕ Panels are easily damaged; replacement/new panels do not match existing in place panels
✕ Using a concealed spline makes access to valves and function boxes more difficult than T-grid
◆ Tenants hide things in ceilings (drugs)
Lay in electrical fixtures are inexpensive, easily installed and can be relocated
Good acoustical properties

SPECIFICATIONS

SUSPENDED GYPSUM BOARD CEILINGS

$

○ KITCHENS
○ COMMUNITY KITCHENS
○ BATHROOMS
○ COMMUNITY BATHROOMS
○ LOBBIES
○ HALLWAYS
○ COMMUNITY ROOMS
○ UNIT ROOMS
○ OFFICES
○ LAUNDRY ROOMS
○ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
■ NOT ACCEPTABLE/NOT APPLICABLE

BRANDS

DESCRIPTION Supsended gypsum board ceilings are attached to a grid system of metal runners hung from the building structure.

ADVANTAGES(✔) / DISADVANTAGES(✕) / ITEMS DISCUSSED(◆)

excellent appearance, similar to gypsum board celings attached directly to the structure.
easier to maintain, clean, and paint than lay-in grid systems.
access panels must be provided for access to mechanical ducts above.

GYPSUM BOARD

$1.24 S.F. (TAPED, SANDED AND PAINTED)

- O KITCHENS
- O COMMUNITY KITCHENS
- O BATHROOMS
- O COMMUNITY BATHROOMS
- O LOBBIES
- O HALLWAYS
- O COMMUNITY ROOMS
- O UNIT ROOMS
- O OFFICES
- O LAUNDRY ROOMS
- O TRASH ROOMS

- ● PREFERRED
- O ACCEPTABLE
- ◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED IN HALLWAYS, UNIT ROOMS, OFFICES, COMMUNITY ROOMS, LAUNDRY ROOMS AND KITCHENS

- PREFERRED IN LOBBIES AND BATHROOMS ABOVE 4'-0"

BRANDS

U.S. Gypsum, Goldbond

DESCRIPTION
(COMMONLY KNOWN AS "GYP" BOARD, SHEETROCK AND "ROCK")

Gypsum board is a panel consisting of a core of gypsum faced with paper each side and comes in fire-rated and non-rated sheets with the common thickness of 1/2" and 5/8", 4'-0" widths by 8'-0" and longer lengths. Gypsum board is also available in a water-resistant composition commonly known as "green board".

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

✔ Gypsum Board with the appropriate coats of tape and wall compound (one coat of adequate primer and two finish coats of paint) is the preferred choice for most wall surfaces where moisture is not a problem.

◆ With old plaster, use self levelling-patch plaster at small areas rather than applying new gyp board. Large areas may need to be covered with the appropriate gypsum board. (Follow maufacturer's recommendations).

SPECIFICATIONS

- Use 5/8 " thick Type X fire rated for all construction requiring fire rating
- Use Type X throughout if majority of project requires fire rating.
- as of 1995, all 5/8" gypsum board manufactured in the U.S. is fire rated. However, old stock of non-rated board may still be around; always check, don't assume.

- Use water Resistant Gypsum board at all walls at bathroom, lavatories and janitor's closets. (At showers specify cementitious ("wonderboard") not water resistant gypsum board)
- If gypsum board is used to patch areas of missing plaster and wood lath, specify "furring" as required to allow the finished gypsum boad to match the level of the adjacent existing plaster surface.
- Please note that manufacturers of water-resistant gypsum board do not recommend the use of "green board" on ceilings. However, the Universal Building Code 1994, Section 2512, allows the use on ceilings if the ceiling framing does not exceed 12 inches on center.
- To reduce the number of "nail pops", screw attachment for gypsum board is preferred over nailing.
- To increase sound control between walls, caulk continuous at top and bottom during installation.
- Gypsum board at walls should be installed in sheets horizontally with tapered edges intersecting. Sheets should also be staggered.
- Gypsum board at window corners and door opening top corners should be "L" shaped.

- Gypsum board installation at the base of the wall should maintain a gap (1/8" inch minimum/ 3/8" inch maximum) to account for building settlement and reduce gypsum board showing "stress joints".
- The tape that covers the gypsum board intersections contains recycled products that may "telegraph" through most paint primers. New primers are being developed to provide adequate coverage. Specify accordingly.
- Gypsum board comes in a variety of finishes;
    a. smooth
    b. spray texture (Heavy to Light)
    c. Spray texture with "knock-down" or "skip-trowel"

finish for texture finishes, specify a 2'x 2' sample of the proposed finish on gypsum board to insure consistency of texture and expectation of finish.

GYPSUM PLASTER (INTERIOR)

$

- ◘ KITCHENS
- ◘ COMMUNITY KITCHENS
- ◘ BATHROOMS
- ◘ COMMUNITY BATHROOMS
- ◘ LOBBIES
- ◘ HALLWAYS
- ◘ COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ○ OFFICES
- ○ LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

BRANDS

DESCRIPTION

Gypsum plaster is a ground calcined gypsum combined with various additives to control the coNsistency and mixture. Gypsum plaster is typically available as ready-mixed (mill mixed and premixed plaster with a mineral aggregate. Gypsum plaster can be applied over wood lath or metal rib lath at ceiling application.

ADVANTAGES(✔) / DISADVANTAGES(×) / ITEMS DISCUSSED(◆)

✔ Now rarely used in new construction because of the cost advantage of gypsum wall board, plaster is usually the wall surface in older buildings being renovated. Depending on the severity of cracks, repair proves to be cost effective over replacement with gypsum board.

Repair of cracked plaster surfaces should proceed with the determination of whether hazardous materials such as asbestos are present. A certified industrial hygienist should be retained to develope a hazardous materials assessment and if necessary, an abatement program

SPECIFICATIONS

- Verify that the existing wood metal lath is in sound condition. If not, specify new lath to match existing in soundness of construction and thickness.
- The preference for the repair of interior hairline plaster cracks is to tape and wall compund over the hairline cracks. Feather successive coats of wall compound as needed to match adjacent surfaces.
- Verify that the existing plaster is "keyed" properly to the existing lath. Any loose, "non-keyed" plaster should be removed to the existing lath.
- Specify that the *entire* surface is to receive primer and a minimum of two coats of paint finish.
- Make provisions to minimize splattering of plaster or other work. Remove all plaster promptly from surfaces not to be plastered.

CEMENT PLASTER (STUCCO)

$

- ● KITCHENS
- ● COMMUNITY KITCHENS
- ● BATHROOMS
- ● COMMUNITY BATHROOMS
- ○ LOBBIES
- ○ HALLWAYS
- ○ COMMUNITY ROOMS
- ○ UNIT ROOMS
- ○ OFFICES
- ○ LAUNDRY ROOMS
- ○ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED IN BATHROOMS

BRANDS

DESCRIPTION

Cement plaster is a plaster made with Portland cement and usually applied in three coats: scratch and brown coat, and finish coat.

ADVANTAGES(✔) / DISADVANTAGES(×) / ITEMS DISCUSSED(◆)

✔ Cement plaster is used in many older buildings and has a very long life span.

✔ Cement plaster works especially well in high moisture areas like bathrooms.

× Expansion joints and cracking may occur in certain situations

SPECIFICATIONS

- On exterior application, cement plaster over sheathing (exterior grade, plywood, gypsum or similar material) is prederred to eliminate "telegraphing" of studs in wall cavity.
- Control joints should be located at corners of openings

CERAMIC TILE

$7.05 S.F.

- ● KITCHENS
- ● COMMUNITY KITCHENS
- ● BATHROOMS
- ● COMMUNITY BATHROOMS
- ○ LOBBIES
- ◘ HALLWAYS
- ◘ COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ◘ OFFICES
- ◘ LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED IN ALL BATHS AND KITCHENS

- PREFERRED IN MAIN AND ELEVATOR LOBBIES

BRANDS
AMERICAN OLEAN
DAL-TILE

DESCRIPTION
Ceramic tiles are made by pressing and firing clay and are available in glazed, unglazed and textured finish.

ADVANTAGES(✔) / DISADVANTAGES(✕) / ITEMS DISCUSSED(◆)
✔ Although a higher initial installation cost, ceramic tile pays for itself in the long run, with lower replacement and maintenance costs.
✔ It is highly durable against heavy use and, with grout additive, more resistant to water infiltration.
✔ Ceramic tile is a preferred choice for bathrooms and kitchens, especially those that experience heavy use.
✕ In areas with equipment traffic (eg. trashrooms), tile cracks and causes problems.
✕ Thickness to tile and mortar bed may pose accessibility problems in existing buildings. 1/2" rise max. per ADA

SPECIFICATIONS
- Mortar bed installation is preferred.
- Thin-set tile installation over glass fiber mesh board (aka. "Wonderboard", "Durarock", etc.) is the next preferred installation method.
- Avoid thin-set tile installation over water-resistent gypsum board
- Avoid "light-colored" grout at floors
- Use "slip-resistant" tile at floors. "Matte" finish floor tiles may be acceptable if smaller tile sizes are used and sufficient grout "friction" lines are established. Avoid using glazed tile at floors.

-Consult the Tile Institute Manual for acceptable installation details.

LINOLEUM

$4.75-$5.00/SF
1/4" plywood subfloor $1.25/SF

- ● KITCHENS
- ○ COMMUNITY KITCHENS
- ◘ BATHROOMS
- ◘ COMMUNITY BATHROOMS
- ● LOBBIES
- ● HALLWAYS
- ● COMMUNITY ROOMS
- ● UNIT ROOMS
- ● OFFICES
- ● LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED IN INDIVIDUAL KITCHENS

- PREFERRED IN HALLWAYS, LOBBIES AND COMMUNITY ROOMS

-ACCEPTABLE IN UNIT ROOMS AND OFFICES

BRANDS
FORBO INDUSTRIES
GERBERT LIMITED

DESCRIPTION
Linoleum is a natural product made from linseed oil, pine tar resin, cork and jute. It is an ecologically friendly product that decomposes naturally, unlike sheet vinyl and other synthetic products.

ADVANTAGES(✔) / DISADVANTAGES(✕) / ITEMS DISCUSSED(◆)
✔ durability compares to that of more expensive materials like ceramic tile.
✔ Linoleum holds up very well to spills, stains, and nicks and should not stain if burned.
✕ Replacement may be difficult, although 12" x 12" tiles are available at a higher cost.
◆ Linoleum stretches over time making seams tighter rather than separating. Installers should account for this stretching.

SPECIFICATIONS
- Insure quality of subtrate and install per manufacturers recommendations.
- Sealer specified by manufacturer must be applied and maintained to assure longevity and cleanability of product.
- any irregularity in the subfloor will telegraph through the finish floor. 1/4" subfloor should be applied over existing surface.
- application of linoleum over damp substrate is to be avoided.

- Heat sealed seams should be specified

- think of linoleum like wood -- it swells if wet

QUARRY TILE

$7.20 S.F.

- ● KITCHENS
- ● COMMUNITY KITCHENS
- ● BATHROOMS
- ● COMMUNITY BATHROOMS
- ● LOBBIES
- ○ HALLWAYS
- ○ COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ◘ OFFICES
- ◘ LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED IN ALL BATHES AND KITCHENS

- PREFERRED IN MAIN AND ELEVATOR LOBBIES

BRANDS

DESCRIPTION

Quarry tile is formed by an extrusion from clay or shale.

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

✔ Like ceramic tile, it is highly durable, requires low maintenance and is very cost effective over time.

✔ Use of unglazed tiles is preferred because it reduces the chance of slips and accidents.

X Cracks and settling will transfer through tiles, especially when two kinds of materials meet.

X Thickness to tile and mortar bed may pose accessibility problems in existing buildings. 1/2" rise max. per ADA

SPECIFICATIONS

- See CERAMIC TILE

MEXICAN PAVERS

$8.25 S.F.

- ● KITCHENS
- ● COMMUNITY KITCHENS
- ● BATHROOMS
- ● COMMUNITY BATHROOMS
- ● LOBBIES
- ○ HALLWAYS
- ◘ COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ◘ OFFICES
- ◘ LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- ACCEPTABLE IN INDIVIDUAL KITCHENS

- PREFERRED IN MAIN AND ELEVATOR LOBBIES

BRANDS

DESCRIPTION

Mexican pavers are formed by compressing clay and dust.

ADVANTAGES(✔) / DISADVANTAGES(×) / ITEMS DISCUSSED(◆)

✔ Mexican pavers have a high initial cost, but like ceramic and quarry tile, they are very durable, and cost effective in the long term.

× they are more porous than ceramic tile and may not be appropriate in bathrooms and kitchens.

× Like other ceramic tiles, pavers tend to have a cold surface and may break under heavy loads.

× Cracks and settling will transfer through tiles.

× Thickness to tile and mortar bed may pose accessibility problems in existing buildings. 1/2" rise max. per ADA

SPECIFICATIONS

- See CERAMIC TILE

EPOXY FLOORING

$6.00-$8.00/ S.F.

- ● KITCHENS
- ● COMMUNITY KITCHENS
- ● BATHROOMS
- ● COMMUNITY BATHROOMS
- ● LOBBIES
- ○ HALLWAYS
- ◘ COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ◘ OFFICES
- ◘ LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED IN COMMUNITY KITCHENS AND BATHROOMS

BRANDS

MAGNASITE
DEX-O-TEX

more info call:
Advanced Flooring Systems
750 24 St.
San Francisco
415-647-8955

DESCRIPTION

Epoxy flooring is a layered epoxy waterproofed mortar with a pigmented sealer.

ADVANTAGES(✔) / DISADVANTAGES(✕) / ITEMS DISCUSSED(◆)

✔ It is a poured flooring and can be coved.
✔ It is inexpensive and very durable with a high tensile strength.
✔ It can and should be used with a floor drain to provide appropriate sanitary conditions.
✕ Cracks and settling will transfer through finished flooring.

SPECIFICATIONS

-Well supported subfloor is mandatory. Check framing and add plywood over existing subfloor if required.

-Provide 3-4 lb. reinforced expanded galvanized metal lath.

-1/8" G26 Dex-o-tex or equal underlayment with concealed metal lath recommended.

- 1/4" solid colored epoxy coating (mix 3-4 lbs light aggregate into every batch of 100-90 lb. aggregate for non slip surface)

- two top coats sealer. On last coat, add colored aggregate with sealer

VINYL COMPOSITION TILE

$1.24-2.24/S.F.

- ○ KITCHENS
- ◘ COMMUNITY KITCHENS
- ○ BATHROOMS
- ◘ COMMUNITY BATHROOMS
- ◘ LOBBIES
- ◘ HALLWAYS
- ○ COMMUNITY ROOMS
- ○ UNIT ROOMS
- ○ OFFICES
- ◘ LAUNDRY ROOMS
- ◘ TRASH ROOMS

- ● PREFERRED
- ○ ACCEPTABLE
- ◘ NOT ACCEPTABLE/NOT APPLICABLE

- ACCEPTABLE IN KITCHENS, HALLWAYS, COMMUNITY ROOMS, LAUNDRY ROOMS AND LOBBIES

BRANDS

TARKETT
AZROCK
ARMSTRONG

DESCRIPTION

Vinyl Composition Tile is made up of limestone powder and polymers.

ADVANTAGES(✔) / DISADVANTAGES(×) / ITEMS DISCUSSED(◆)

× It is semi-durable

✔ It is available in many colors and patterns which permits decorative designs with small additional cost.

× By the building code, it is not allowed in public bathrooms because water can penetrate the seams. This may also be a problem in kitchens, where individual tiles may pop up if the substrate gets wet. Moisture problems can be kept to a minimum with proper installation (laying and sealing) and maintenance.

✔ Because it is produced in 12"x 12" tiles, selective replacement is possible, though color matching with existing faded tiles may not be acheivable.

◆ Some tenants use excessive amounts of water to clean. Consequently, seams separate and the subfloor is damaged.

SPECIFICATIONS

- Insure quality of substrate and install per manufacturer recommendations.
- Require Contractor to provide manufacturer's recommended maintenance instructions for each type of flooring installed.
- Require Contractor to furnish owner at least two percent of each different flooring material and base. Place in original containers plainly marked with type, color and quantity of contents.
- Examine substrate for excessive moisture content and uneveness; do not proceed until defects have been corrected.
- Surface of subfloor to be smooth; any depressions, holes or cracks to be filled and patched; any protrustions to be removed and sanded smooth.
- Lay tiles from center marks of principal walls so that tiles at opposite edges of room are of equal width.

i- Patterns diagonal to walls generally have higher installation costs but hide irregularities in wall surfaces.

SHEET VINYL

$2.39-$3.717 S.F.

- ● KITCHENS
- ◘ COMMUNITY KITCHENS
- ◘ BATHROOMS
- ● COMMUNITY BATHROOMS
- ◘ LOBBIES
- ◘ HALLWAYS
- ◘ COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ◘ OFFICES
- ○ LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- NOT ACCEPTABLE IN COMMUNITY KITCHENS OR BATHS

- ACCEPTABLE IN LAUNDRY ROOMS, INDIVIDUAL BATHS AND INDIVIDUAL KITCHENS

BRANDS

DESCRIPTION

Sheet vinyl is made up of polyvinyl chloride, resins, pigments and inert fillers.

ADVANTAGES(✔) / DISADVANTAGES(✕) / ITEMS DISCUSSED(◆)

✔ Vinyl with integral pattern throughout the thickness is somewhat more expensive, but more durable.
✔ In low-use bathrooms or kitchens it may be acceptable since it is a seamless product and coves well.
✔ There is a wide price and quality range available in sheet vinyl, but the better quality is definitely worth the price.
✕ Sheet vinyl tends to scratch easily, shows cigarette burns and is difficult to repair, usually requring replacement of entire floor.
✕ It is widely used because of initial low cost, but frequent replacement is required in high use areas.
✕ Burns, cuts, separation at seams requires replacement of entire floor.

SPECIFICATIONS

- Also see VINYL COMPOSITION TILE
- Lay sheets in single length from wall to wall. Extend flooring into recessed, door reveals and similar spaces.
- Lay sheets with seams square to room axis; match patterns at seams.
- Make all seams tight, with solid adherence to substrate.
- Provide integral coved base at all toe spaces of cabinets and at vertical surfaces; use the specified vinyl cove strip backing. Provide metal or vinyl cap strip.

CARPET

$2.08-$5.92 S.F. ($15.00-$53.28 Sq.Yard.)

- ◘ KITCHENS
- ◘ COMMUNITY KITCHENS
- ◘ BATHROOMS
- ◘ COMMUNITY BATHROOMS
- ◘ LOBBIES/CORRIDORS
- ○ HALLWAYS (LIGHT TRAFFIC)
- ○ COMMUNITY ROOMS
- ○ UNIT ROOMS
- ○ OFFICES
- ◘ LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED IN HALLWAYS

BRANDS

DESCRIPTION

Carpet is made by attaching yarns to a coarse fiber backing. It comes in two different types: Level loop, which has a harder texture and is more durable; and cut pile which has a softer texture and works better for low traffic areas such as bedrooms in individual units. Solution dyed carpet is a coloring process which guarantees the sustainability of a carpet's color. This type of carpet should always be chosen, especially in high traffic areas or areas likely to stain. Carpet is always backed with a natural product(like jute) or a synthetic product (like polypropelene). Synthetic backings work better for moisture protection.

ADVANTAGES(✔) / DISADVANTAGES(×) / ITEMS DISCUSSED(◆)

✔ Carpet is great for its sound deadening qualities, softness, and warmth.
× It has a low durability in high traffic areas and is difficult to patch or replace.
× Carpet is also susceptible to burns or stains and can be a dust hazard.
× Carpet is seen by some tenants as a dust and dirt trap
×Tenants do not have vacuum cleaners, so cleaning may be a problem.
◆Months after installation the stains and ground in dirt make it unattractive and unsanitary.
◆Carpet on stairs also wears badly. Maintenance staff prefers rubber treads and nosings.

SPECIFICATIONS

- In general, direct glue down applications are more durable and definitely more appropriate for disabled and senior applications.
-Level loop carpet is preferred in heavy use areas because it does not show wear patterns.

CARPET TILE

$$4.27 S.F. ($38.50 S.Y.)

- ◘ KITCHENS
- ◘ COMMUNITY KITCHENS
- ◘ BATHROOMS
- ◘ COMMUNITY BATHROOMS
- ◘ LOBBIES
- ○ HALLWAYS
- ○ COMMUNITY ROOMS
- ○ UNIT ROOMS
- ○ OFFICES
- ◘ LAUNDRY ROOMS
- ◘ TRASH ROOMS

- ● PREFERRED
- ○ ACCEPTABLE
- ◘ NOT ACCEPTABLE/NOT APPLICABLE

BRANDS

DESCRIPTION

Carpet tiles are made by attaching yarns to a coarse fiber backing and cut into tiles.

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

✔/X Carpet tiles have the same advantages and disadvantages as rolled carpet, except that it comes in tiles, which makes selective replacement possible, although as with V.C.T., color match between replacement and existing tiles is problematic.

X Seams can be problematic.

SPECIFICATIONS

NEW
$$10.00-$15.00/ S.F.

REPAIR EXISTING WOOD FLOORING
$1.28-$3.02 S.F.

- ○ KITCHENS
- ◘ COMMUNITY KITCHENS
- ◘ BATHROOMS
- ◘ COMMUNITY BATHROOMS
- ● LOBBIES
- ● HALLWAYS
- ● COMMUNITY ROOMS
- ● UNIT ROOMS
- ● OFFICES
- ◘ LAUNDRY ROOMS
- ◘ TRASH ROOMS

- ● PREFERRED
- ○ ACCEPTABLE
- ◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED IN LOBBIES, COMMUNITY ROOMS, INDIVIDUAL ROOMS, OFFICES AND HALLWAYS

- ACCEPTABLE IN INDIVIDUAL KITCHENS

WOOD TILE IS NOT ACCEPTABLE IN KITCHENS, UNIT ROOMS, OR OFFICES

- WOOD TILE IS ACCEPTABLE IN HALLWAYS AND COMMUNITY ROOMS

BRANDS

HARRIS-TARKETT laminated wood flooring

DESCRIPTION

1. GENERAL

Hardwood floors come in strips, planks or tile, and in a variety of wood including oak, pine and maple.

2. WOOD TILES

Otherwise known as parquet.

ADVANTAGES(✔) / DISADVANTAGES(✕) / ITEMS DISCUSSED(◆)

✔ Solid wood floors are very desirable in many applications because of their high durability, low maintenance, natural aesthetic and warmth, low dust levels, and overall cost effectiveness.

✔ It is an option to refinish existing subflooring; with an appropriate polyurethane finish, the durability approaches that of a new hardwood floor.

✔ Wood tiles have high durability, low maintenance, and low dust levels. They are available prefinished.

✕ The disadvantages of wood flooring include: sound transmission problems in high traffic corridors; public perception that wood floors are a luxury and not an appropriate affordable housing material; and steam radiators, if existing, may cause swelling in the floors.

Scratches, cuts, burns to wood flooring can be repaired.

Vinyl inpregnataed wood flooring offers even greater durability than standard wood flooring.

SPECIFICATIONS

MARBLE AND GRANITE

$13.40 S.F.

- ○ KITCHENS
- ● COMMUNITY KITCHENS
- ○ BATHROOMS
- ● COMMUNITY BATHROOMS
- ● LOBBIES
- ◘ HALLWAYS
- ◘ COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ◘ OFFICES
- ◘ LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED IN COMMUNITY KITCHENS, COMMUNITY BATHROOMSAND LOBBIES

- ACCEPTABLE IN INDIVIDUAL KITCHENS AND BATHROOMS

BRANDS

DESCRIPTION

Marble and granite are quarried stone flooring.

ADVANTAGES(✔) / DISADVANTAGES(×) / ITEMS DISCUSSED(◆)

✔ They are highly durable, very wear-resistant against traffic, spills and burns, water damage and whatever else that may challenge their durability.

× Their high installation cost makes is difficult to use in many low income projects from a cost and public image point of view.

✔ In certain applications, such as a small lobby that receives an intense amount of traffic, marble or granite can be cost effective.

× Does not comply with ADA silp-resistance when wet.

SPECIFICATIONS

12" X 12" X 3/8" tiles are common

CONCRETE

$ S.F.

- ◘ KITCHENS
- ○ COMMUNITY KITCHENS
- ◘ BATHROOMS
- ○ COMMUNITY BATHROOMS
- ◘ LOBBIES
- ◘ HALLWAYS
- ◘ COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ◘ OFFICES
- ○ LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED IN TRASH ROOMS

- ACCEPTABLE IN LAUNDRY ROOMS, COMMUNITY BATHROOMS AND COMMUNITY KITCHENS

BRANDS

DESCRIPTION

Concrete is a mixture of Portland cement, sand , water and gravel.

ADVANTAGES(✔) / DISADVANTAGES(✕) / ITEMS DISCUSSED(◆)

✔ Its low cost, high durability, water resistance and low maintenance works well in industrial situations like trash rooms.
✔If a color is desired, integrally mixed colors are preferred over paint since painted concrete floors tend to peel and flake.
◆ Concrete has industrial/utilitarian feel which is not appropriate for finished spaces.

SPECIFICATIONS

RESILIENT TERRAZZO FLOOR TILE

$11.00/ S.F.

- ● KITCHENS
- ● COMMUNITY KITCHENS
- ● BATHROOMS
- ◘ COMMUNITY BATHROOMS
- ● LOBBIES
- ○ HALLWAYS
- ● COMMUNITY ROOMS
- ○ UNIT ROOMS
- ○ OFFICES
- ◘ LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED FOR INDIVIDUAL KITCHENS, INDIVIDUAL BATHROOMS, COMMUNITY KITCHENS, LOBBIES, AND COMMUNITY ROOMS

- ACCEPTABLE FOR HALLWAYS, UNIT ROOMS AND OFFICES

BRANDS

FRITZ TILE

DESCRIPTION

Resilient terrazzo floor tiles are made with marble chips in a resin matrix. It comes in 12" x 12" tiles.

ADVANTAGES(✔) / DISADVANTAGES(✗) / ITEMS DISCUSSED(◆)

✔ It is a durable flooring product that comes in a wide variety of textures and in colors of marble.
✔ Because it comes in tile form,selective replacement is possible.
✔ Like Vinyl composition tile it should be sealed with a wax finish and buffed.

SPECIFICATIONS

- 3/16" and 1/8" tiles are available
- 1/8" tiles are easier to install

Poured in place terrazzo may also be considered. This traditional terrazzo comes in a variety of thicknesses fromthe epoxy-based type at 3/8" thick to the cement based at 3" thick. Metal control joints vary from 12'-0" o.c. to 30"-0" o.c. Costs between $25-@35/ S.F. installed. Very long lasting, virtually maintenance free.

CERAMIC TILE

$4.98 S.F.

- ● KITCHENS
- ● COMMUNITY KITCHENS
- ● BATHROOMS
- ● COMMUNITY BATHROOMS
- ○ LOBBIES
- ○ HALLWAYS
- ○ COMMUNITY ROOMS
- ○ UNIT ROOMS
- ○ OFFICES
- ○ LAUNDRY ROOMS
- ○ TRASH ROOMS

- ● PREFERRED
- ○ ACCEPTABLE
- ◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED FOR KITCHEN BACKSPLASHES

- PREFERRED IN ALL BATHES

- PREFERRED IN LOBBIES AS WAINSCOTING

BRANDS

DESCRIPTION

Tile comes in many forms, but ceramic tiles are most commonly used on walls.Ceramic tiles are made by pressing and firing clay and are available in glazed, unglazed and textured.

ADVANTAGES(✔) / DISADVANTAGES(×) / ITEMS DISCUSSED(◆)

✔ Tile is highly durable, requires low maintenance and is very cost effective over time.

✔Glazed tiles are preferred for easy maintenance

- Methods of installation include:
1. mortar-set-mortar over metal lath
2. thin-set-skim coat of mortar over cementitious board "wonderboard"; or water resistant gypsum board (green board).

Mortar set or thin set over cementitious board must be used in showers, tubs or very wet areas. Maintenance staff says greenboard in these areas is "a joke".

SPECIFICATIONS

condition of surface:
- Verify all surfaces are dry, firm, level, clean, free of oily films and loose particles and of proper thickness
- Ascertain all plumbing work and other items concealed behind tiles are in place

installation
- Grout should be pre-colored waterproof, must be certified by manufacturer as suitable
- Grout all joints full, wipe our grout to match contour of cushion edge tile, strike joints of paver tile flush with surface.
- Set all tile with horizontal and vertical joints continuous and aligned in both directions.
- Adjust wainscot heights slightly to utilize full tile.
- Lay our all tile with fields centered, avoid use of tile less than 1/2 size.
- Make all inside corners coved. Outside corners coved
- Clean tile and adjacent surfaces of mortar and grout as work progresses
- Corners and perimeter of tub should be checked twice a year for condition of grout and caulk.
-Waterproof membrane f(15 lb buiding paper) is required by code behind cementitious or green board.

WOOD WAINSCOTING

$ S.F.

- ● KITCHENS
- ● COMMUNITY KITCHENS
- ● BATHROOMS
- ● COMMUNITY BATHROOMS
- ○ LOBBIES
- ○ HALLWAYS
- ○ COMMUNITY ROOMS
- ○ UNIT ROOMS
- ○ OFFICES
- ○ LAUNDRY ROOMS
- ○ TRASH ROOMS

- ● PREFERRED
- ○ ACCEPTABLE
- ◘ NOT ACCEPTABLE/NOT APPLICABLE

- PREFERRED IN HALLWAYS AND LOBBIES

BRANDS

DESCRIPTION

Wood wainscoting is made up of strips of wood pieced together to form a continuous surface at the lower portion of a wall.

ADVANTAGES(✔) / DISADVANTAGES(✕) / ITEMS DISCUSSED(◆)

✔ Wood wainscoting helps protect against everyday abuse and adds a warm and natural feeling to a space.

SPECIFICATIONS

LAMINATED WALL BOARD

$ S.F.

- ○ KITCHENS
- ○ COMMUNITY KITCHENS
- ○ BATHROOMS
- ○ COMMUNITY BATHROOMS
- ◘ LOBBIES
- ◘ HALLWAYS
- ◘ COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ◘ OFFICES
- ◘ LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

BRANDS

TUFLINER (BP PRODUCTS)
MARLITE

DESCRIPTION

Laminated wall board is a plastic or fiberglass material used over gypsum board or laminated over a backing. Fasteners, trim pieces and corner guards are generally metal.

ADVANTAGES(✔) / DISADVANTAGES(×) / ITEMS DISCUSSED(◆)

✔Least expensive solution where non porous surfaces aree required.
✔Limited variety of colors and textures
×Susceptible to scratchs, burns
×Caustic cleaning materials dull finish
×Metal trim pieces do not match material

SPECIFICATIONS

Specify whole sheets be applied horizontally to minimize seams.

SYNTHETIC WALL PRODUCTS

$ S.F.

- ● KITCHENS
- ● COMMUNITY KITCHENS
- ● BATHROOMS
- ● COMMUNITY BATHROOMS
- ○ LOBBIES
- ○ HALLWAYS
- ○ COMMUNITY ROOMS
- ◘ UNIT ROOMS
- ◘ OFFICES
- ○ LAUNDRY ROOMS
- ◘ TRASH ROOMS

● PREFERRED
○ ACCEPTABLE
◘ NOT ACCEPTABLE/NOT APPLICABLE

BRANDS

ACROVYN
KYDEX
PANEL SPECIALISTS, INC. (PSI)
USG

DESCRIPTION

Synthetic wall coverings are non absorbent thermoplastic coverings which can be laminated to sound absorbant panels or applied directly over gypsum board. Fasteners, trim pieces and corner guards in the same integral color thermoplastic and color matched sealants create a non porous, surface required in bathrooms and kitchens.

ADVANTAGES(✔) / DISADVANTAGES(×) / ITEMS DISCUSSED(◆)

✔Less expensive than ceramic tile
✔Durable: scratch and burn resistant
✔Integral color throughout material
✔Available in a wide variety of colors and textures
×Somewhat institutional in appearance

SPECIFICATIONS

Specify whole sheets be applied horizontally to minimize seams. Sheets are available in 8' and 10' lengths so whole walls in most bathrooms can be covered without seams.

$ S.F.

DESCRIPTION

ADVANTAGES(✓) / DISADVANTAGES(×) / ITEMS DISCUSSED(◆)

SPECIFICATIONS

ADVANTAGES(✓) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

◆ Be sure to include all types of building signage in specifications: Building address, emergency evacuation, all unit rooms and all public spaces

Consult with the maintenance staff....
◆ Consider the following: Instructional or warning signage to be included at shutoffs, electric panels, standpipes, extinguishers, fire panels, elevator recall, service rooms, water/gas main shut offs, overhead pipes and roof access.
◆ Adopt a standard policy regarding locations requiring signage.

ADA requirements.....
◆ Coordinate all signage with lenders and applicable codes. Signage now must meet Accessibility standards, including raised letters and braile lettering. All areas must meet ADA standards, not just accessible areas. (ADA requirements address sight imparements as well as accessibility)

On a tight budget?.....
◆ Inexpensive and effective engraved plastic signage can be purchased at Office Depot. It is quick and readily available. Standard styles and colors are available including: white & green (safety), black & white (unit numbers) and red & white (fire safety). These come with glue backing but should be securely screwed at corners to prevent vandalism.
◆ Low level exit signage, where required, can be satisfied with non-electrified, surface mounted signage.
◆ Glue on letters are easily removed by tenants. Screw on plastic signage with tamperproof screws is acceptable.

◆ For entry signage consider something special (perhaps created by local artisans) which can add dignity to the housing. Specify a standard signage to establish a base price to be part of construction budget. The difference between the base bid and the price for an art piece may be funded through a foundation or a special fundraiser.
◆ Speical designed signage can be made to conform to ADA standards but still be a unique statement. ADA emphasizes contrast between the information and the background in both color and surface, the addition of braile lettering and the height and location of the signage. WIthin the guidelines great latitude in artistic expression is possible.

ADVANTAGES(✓) / DISADVANTAGES(×) / ITEMS DISCUSSED(◆)

◆ TUB SURROUNDS

◆ Ceramic tile is the preferred choice for tub surrounds-see ceramic tile for preferred installation techniques.

◆ Plastic and fiberglass surrounds tend to dry out when cleaned with caustic mataerials (soap). Tenants need special education about proper cleaning. The surface needs to be waxed periodically.

◆ The backing forplastic/fiberglass surrounds is very important; if not level the surround will come away from the wall and allow water infiltration.

◆ Joints in surrounds should be caulked, NOT grouted.

◆ SHOWER PROTECTION

◆ Shower doors for tubs are made to be installed either way. Once set the holes not used must be sealed to keep water from getting under the tracks.

◆ Curtains should be installed at disabled accessible showers and baths.

◆ If doors are not used, a tub diverter is recommended at the ends of the tub at the wall to keep water IN the tub.

◆ All faucets, controls, overflows etc. should be properly caulked. The caulking should be checked on a regular basis and every time tenants change.

COST

cost index

100 coated steel
115 plastic laminate
270 phenolic
280 solid polymer plastic
310 stainless steel

BRANDS
BOBRICK

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

1. Toilet partitions (public bathrooms)

◆ Baked enamel finishedand steel screens or toilet enclosures adjacent to urinals are not recommended. (corrosion due to splashing). Suggested materials for toilet partitions are plastic laminate, solid polymer plastic, stainless steel.

2. Partition hardware

◆ Specify concealed latch ADA handle
◆ Specify polished stainless steel or chrome -- all theftproof
◆ Coat hook and bumper

3. Common / Public Toilet Room Accessories

◆ In SRO's and heavy use applications specify RECESSED accessories or they will be kicked and destroyed.
◆ Paper towel dispensers - suggest single folded paper towel dispenser
◆ Toilet paper holders: two roll dispenser that use standard toilet tissue and has theft resistant rollers or "prison" paper dispensers to discourage theft.
◆ Seat cover dispensers:
◆ Soap dispensers: liquid or powder soap
◆ Mirror & Frames: stainless steel frame with integral shelf is suggested.
◆ Grab bars: use State & National codes for handicap standards.
◆ Tampon dispensers are frequently destroyed by people looking for money. Consider tampons sold at the front desk.

4. Unit Bathroom Accessories

◆ Toilet paper holders single hook type (no spring load types)
◆ Soap holders
◆ Mirrors / medicine cabinets

ADVANTAGES(✓) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

◆All units must have energy efficient appliances:

◆Pilotless 30-inch, four burner gas range with child-safe control knobs and self cleaning oven. Exhaust hood with light is required. The exhaust duct shall vent to the exterior and shall be enclosed by casework overhead.

◆Energy efficient two door, frost free refrigerator; reversible door is recommended Doors must open wide enough to permit drawer removal for cleaning:

14 c.f. minimum for up to two-bedroom units
16 c.f. minimum for three-bedroom units or more

◆one garbage disposal is required in each unit.

◆Washer/dryer facilities should be provided. A minimum of one washer and dryer shall be provided in a common area for each ten units.

◆Water heater capacities must be 30-gallon for up to two bedroom units and 40-gallon for three bedroom units or more.

PROBLEMS REPORTED

◆Even high quality metal blinds are permanently damaged if bent.

COST

Example: 3' x 6' blinds

vinyl	$10
metal	
6 ga	$30
8 ga	$45
8 ga "designer"	$50 +

ADVANTAGES(✓) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

◆ General: Make sure the window covering chosen is compatable with the window it covers. Horizontal window covering (blinds, shades) work well with double hung windows. Vertial covering (vertical blinds, drapes) are better with horitontal sliding windows. Orientation of covering is especially important with casement windows which open into the room.

◆ All windows into private space, even kitchens should have some form of covering for privacy.

◆ Cleanability and dust control should be considered in the selection of window coverings.

◆ Blinds: Blinds seem to be the preferred solution for individual rooms.

◆ Dust build up tends to be a problem.

◆ Consider buying the least expensive variety and replacing them with change of tenants.

◆ Mini blinds are most popular and realily available but "old fashioned" larger blinds are also viable solutions and easier to clean than the smaller variety.

◆ Metal vs plastic mini blinds:
Plastic is cheaper and will snap back into shape if bent.
Metal blinds are generally higher quality and operate more reliably but are permanently damaged if bent.

◆ Specify that all blinds are to be mounted in the same relationship to the frame, either inside or on the surface of the frame. Otherwise the contractor will purchase standard sizes and mount however they want.

◆ Vertical blinds were preferred by some, but they tend to break at the bottom track.

◆ Drapes: Drapes are more appropriate in common rooms where they contribute to the residential feel of the space.

◆ Drapes collect dust and the fabric can be damaged by the sun, requiring replacement. They were viewed as inappropriate for individual rooms.

◆ Shades: Inexpensive cloth or vinyl shades are preferred by some management companies as they can be easliy replaced if damage and replaced with each change in tenancy.

PROBLEMS REPORTED

- Graffiti
- Vandalism
- People smoking in the elevators-poor ventilation, burns on call buttons and finishes
- Move ins, move outs without use of protective padding
- Fabric pad may wind up as tenant bedding
- Tenants manually stopping elevators between floors

- Frequent breakdowndue to:
- insufficient ventilation in the elevator machine room (elevator gets too hot)
- inadequate reserve oil tank (tank should be 100-150 gallons)

ADVANTAGES(✓) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

◆ Elevators are one of the highest use areas in the building. They should have the most wear and abuse material available.

◆ Antigraffiti paint is available at approx $27/ gallon which wears very well and doesn't chip but creates a surface which cannot be painted over (hence graffiti removal) which prevents future renovation. Cleaning can be with special cleaners or with soap and water depending on which product is selected.

◆ Flooring must be as durable as possible without adding excessive weight (especially in older elevators). Consider extending the durable lobby flooring into the elevator.

◆ Consider specifying finishes which are either nearly indistructable or easily replaced (including a maintenance line item for replacement).

◆ Consider walls panels which are easily detached (with special tools controlled by maintenance). Such panels could be painted with anit graffiti paint and replaced if damaged.

◆ Specify metal floor call buttons to resist burns from cigarettes.

◆ Consider collapsable plywood liners to be used for move-ins, move-outs.

◆ Flooring: Perelli rubber flooring has been used with success.

◆ It is worthwhile to shop around for reliable and cost conscious elevator repair and maintenance companies. Check all references to make sure they are knowledgeable about your type of elevator.

◆ Check funding sources for the degree of accessible upgrade to elevators will be required. Federal money in the project may require full accessibility, not just modification of existing systems.

ADVANTAGES(✓) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

◆ Hydronic heating systems (hot water radiators, underfloor hot water piping) is underrated and underused. Forced air ducts systems are not the only choice.

◆ Forced air gas systems produce very dry air which causes health problems for some.

◆ Forced air systems depend on outside air for combustion. Older, draftier buidings provide enough air through leaks. WIthout outside air,there can be a carbon maonoxide build up. As buildings become tighter forced air systems become less attractive.

◆ Chemical sensitivities and allergies are exacerbated by forced air systems.

◆ Radient systems are cheaper to operate and provide more humidity in the air.

◆ "Flex Watt" is a plastic vinyl sheet used in sheet rock ceilings. It only works on lower ceilings (8'-9') not in cathedral ceilings. The entire ceiling heats up but any nail penetration can destroy it. Contractors and subcontractors must be aware of proper installation.

◆ Tenants need education is using heating systems. Forced air gives immediate gratification, while radient heat takes and hour or more to heat up.

◆ In hydronic systems, the cost of in-the-floor-replacement of damaged parts must be considered in evaluating the cost of the system.

◆ Passive controls-insulation, building orientation etc. must be used. Developers must direct the designers to investigate these controls.

◆ On single family residences old gravity furnaces are usually torn out and replaced with forced air. While the old gravity furnaces are large, they are quiet (no fan) and require no electricity. Forced air systems are noisier and any loss of electric power will also mean loss of heat. .....Are new gravity furnaces available???

◆ Space heaters are not considered safe. They require outside air (provided in old, leaky buildings) and without it they can cause fires. They are not permitted by code.

◆ Wall furnaces which fit into the wall are incompatable with good weatherization practices of insulation.

◆ A water shut-off valve must be provided at each dwelling unit and all plumbing fixtures shall be provided with water shut-off valves on the water supplies.

SPECIFICATIONS

1. All exposed hot water piping must be insulated. Kitchen and bath piping exposed in handicap units shall be wrapped with insulation.
2. Pipe and equipment must be designed for thermal expansion

- Pipe penetrations at roofs, walls, floors and ceilings must be carefully specified and detailed. The responsibility for cutting or drilling holes and flashing, sealing, or otherwise providing penetrations shall be clearly designated. Such penetrations shall be designed so that no opening remains after installation and sealing prevents passage of rodents, vermin, and water. Required fire and smoke ratings shall be maintained.
- Underground piping entering or leaving the building shall be designed to prevent piping failure from backfilling or subsequent building settlement.
- Pipe support shall be carefully detailed using common hanger types and not left to Contractors discretion. Particular care should be given vertical pipe supports to provide for expansion and contraction of lines subject to temperature changes. Coordination of the crafts should be considered in the piping design and specifications should be explicit as to who provides the hangers.
- All uninsulated piping should be isolated from supports by means of felt wrapping or manufactured isolation.
- All piping systems must be braced in accordance with the "Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Systems," as approved by the Office of the State Architect (OSA) Structural Safety Section, Application No. R0010, approved October 13, 1982.
- Pipe labels & painting?
- Valve & equipment tags or labels?
- Furnish & install all mechanical systems, units, equipment and parts to meet California Code of Regulations Title 24, Part 2, 1984. Include all supports, anchors, braces, and other restraining devices required.
- Machinery and equipment located with regard to outside utilities and arranged to provide safe and convenient access for operation, inspection, and maintenance. Refer to City & State requirements for accessibility.
- Machinery and equipment should be located and arranged to prevent heat and noise transmission to adjacent spaces. Provide adequate ventilation and vibration isolation also.
- The completed installation must be free of vibration and noise. Systems, equipment, or parts that vibrate or generate vibration, emit or generate undue noise shall 1) be adjusted, repaired or replaced as necessary to obtain acceptable levels of noise or vibration. 2) be supported or fitted with suppression or absorption devices that prevent the transmission of noise or vibration beyond the offending item.
- Fire Protection: sprinklers, alarms?
- Kitchen and bath faucets should be washerless single-lever type faucets.
- Kitchen sink should be 20 gauge, self-rimming, stainless steel with nickel plating, insulation and 40 mill undercoating with 100% coverage for sound deadening.

- Each unit must have at least one steel/ porcelain tub/ shower combination with a minimum 1/8" solid plastic surround or other surrounds of equal quality. Plastic laminate board is not acceptable.
- Water conserving flush toilets
- A metal pan and drain is recommended for use under water heaters on the ground floor and is required above the first floor.
- An anti-siphon hose bib shall be provided at exterior areas where required.
- The most energy efficient, reasonably priced, heating shall be used. Automatic set-back thermostats are to be provided. All heating supply and return ducts shall be insulated when passing through unheated space.
- Unit temperature controls

common space temperature controls: location + tamperproofing.

- Rooftop mechanical systems to permit reroofing in the future.

Meters / Metering - Gas & Water

- Submittals - materials list, manufactures data, calculations

Record drawings, and operations & maintenance data provided for management group

- Contractor shall be required to submit 4 full sets, completed at one time, of the following:
- As built drawings showing:
    - main shut off valves clearly marked
    - changes in location of piping, ductwork, equipment.
    - ceiling access panels?
    - temperature control device location
- Operation & maintenance data providing:
    - manufacturer's literature providing instructions for operation and maintenance of all mechanical equipment, including replacement parts with name, address, and telephone of local representative.
    - typewritten instructions for operation and maintenance which shall include a maintenance schedule. Operation instructions should include a brief description of the system(s) and indicate proper setting of switches and other control equipment. Do not include adjustments requiring the technical knowledge of service agency personnel. Maintenance instructions should include a list of each equipment item requiring inspection, lubrication or replacement. The maintenance schedule should describe month and year when each item of equipment should be inspected or serviced.
- Materials and equipment should selected from major reputable manufacturers with the ability to provide competent and thorough technical services through local representatives and expeditiously deliver spare parts.

ADVANTAGES(✓) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

◆ Fluorescent fixtures are substantially more energy efficient and cost effective than incandescent fixtures. Traditionally, fluorescent bulbs have been cold and unfriendly, but inovations in the lighting industry have created bulbs that have a wider spectrum and are warmer and more inviting. More fixtures are also being offered that accomodate incandescent and fluorescent bulbs. As we move into a more energy conscious future, fluorescent fixtures will become more and more common.

◆ When choosing fixtures for building, be conscious of the number of different types of bulbs that your fixtures require. A wide variety of different types of bulbs makes the building maintenace expensive and time consuming.

◆ Fluorescent bulbs enclosed in a soffit that provide up and down lighting provides warm, well distributed lighting that may enhance ceiling hung fixtures.

◆ Adequate ceiling light is required to illuminate dining and adjacent areas.

◆ Each level and landing of a stairway must be lighted

◆ Light timers for site lighting

◆ Light fixtures:

- Avoid necessity of extra fixtures; use natural light when possible
- Fluorescent exterior
- Incandescent interior
- Long-term efficiency CRUCIAL
- Provide overhead lights to minimize cost to tenant to make unit liveable.
- Overhead fixture over dining area and in every room.
- Use one-screw (not three-screw) attachment for glass covers to minimize accidental breakage.

SPECIFICATIONS

1. GENERAL

- All plastic lenses for fixtures should be selected for high impact, heat resistance, with non-yellowing aging characteristic.
- Exterior light fixtures and fixtures along public circulation must be vandal resistant. Install exterior lighting fixtures to illuminate all entries, walkways, patios or balconies. Building mounted quartz lighting is recommended for site lighting.

2. SWITCHING AND RECEPTACLES

- Three-way switching is required for stairs and long hallways. The switch shall be located within three feet of the top tread.
- Switching of bathroom fixtures may be controlled independently from light/ outlet. The line side of the fan switch may be wired for feed from the load side of the light switch.
- Locate kitchen receptacles above the back splash. Provide receptacle outlet on both sides of sink and range to prevent cords from crossing either fixture.
-w eatherproof GFI receptacle at the exterior of each unit where building design facilitates tenant need.

-"toggle" (the standard type) on/off switches are preferred to "rocker" type astenants hit the rocker type too hard and they eventually stop working.

SMOKE ALARMS

ADVANTAGES(✓) / DISADVANTAGES(×) / ITEMS DISCUSSED(◆)

◆ Hardwire with battery backup and install as per code.

TELEPHONE

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

◆ All units shall be prewired for telephone service with two outlets provided for each unit.

◆ Phone outlets should be provided in kitchens in larger units.

CABLE TELEVISION

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

◆ Television outlets/ master TV antenna / cable television to be coordinated with the service agent.

◆ Cable TV--hard wire during construction in new buiidings.

INTERCOM

ADVANTAGES(✔) / DISADVANTAGES(X) / ITEMS DISCUSSED(◆)

◆ Security/ entrance intercommunication system are essential to security in any multi family building.

◆ WIth cameras at the entry, systems are available that allow tenants toview the entry through a designated channel on their cable TV. This allows them the selectively buzz in visitors.