

Residential BASEMENT FINISH Checklist and Guide For a Building Permit

(Per the 2015-IRC amended by St. Louis County Ordinances for 1-& 2-Family Dwellings and Townhouses)



This **Basement Finish Checklist** is based on St. Louis County's (SLCO) policies, construction codes amended and adopted by ordinance. See list below. It is not a substitute for those codes and ordinances, but serves as a guide to reading them. For large or more complex new work Basement Finishes, also obtain and refer to St. Louis County's **Single-Family Dwelling Design Checklist** in preparing your drawings.



List of applicable Codes and Ordinances:

- 2015 International Residential Code (IRC)** & Ord. #24427-Ch.1115 ("R" "G", "N", and "M" refs. and Appendix K - Sound Transmission).
- 2015 International Building Code (IBC)** & Ordinance #24444-Ch.1116 ("B" references).
- 2015 International Property Maintenance Code (IPMC)** & Ord. #24440-Ch.1110 ("PM" refs.).
- 2014 National Electrical Code (NEC)** aka NFPA 70 & Ordinance #24439-Ch.1102 ("E" refs.).
- 2015 Uniform Plumbing Code (UPC)** & Ordinance #24441-Ch.1103 ("P" references).

For inquiries regarding the information provided in this guide, please contact:

St. Louis County General Code Enforcement Info _____ (314) 615-5184
 St. Louis County Permit Processing _____ (314) 615-7155
 St. Louis County Zoning Review _____ (314) 615-3763
 St. Louis County Building Plan Review _____ (314) 615-5485

Right-of-Way Owner
 State _____ (888) 275-6636
 County _____ (314) 615-8517
 Municipality _____ Call the project site's Municipality

St. Louis County's Municipal Contracts Matrix shows those municipalities that currently contract for its Code Enforcement services. The Matrix is on our web site at <https://stlouiscountymo.gov/st-louis-county-departments/transportation-and-public-works/residential-building/>

For the electronic plan review, scan QR code or visit us online at <https://stlouiscountymo.gov/st-louis-county-departments/transportation-and-public-works/electronic-plan-review/>



Sections from the Codes, their Referenced Standards, and St. Louis County Ordinances, are shown at ends of statements and are *italicized* in parentheses (.).

NOTICES Regarding Permits



- The applicant (property owner or the owner's authorized agent) is responsible for contacting those agencies that may have legal oversight separate from St. Louis County. Where requirements conflict, the most restrictive shall govern. Contact them before starting any work approved under a permit issued by St. Louis County. Such agencies may include:
 1. The project site's Municipality - submit their site plans approval with a building permit application.
 2. The Sewer District or, where a residence has a septic system and a bedroom is being added, contact St. Louis County Plumbing Inspections.
 3. Subdivision Trustees - they may require you inform them of any new work on your residence.
- Building permit issuance does not authorize construction access to the work site. If a driveway does not exist or cannot be used, the owner/contractor must apply for a permit with the owner of the Right-of-Way to construct somewhere else a temporary entrance into the work site. So, draw 1 or 2, as noted below, on the site plan:
 1. Draw the existing driveway with an arrow on it pointing into the lot and labeled "construction entrance";
OR
 2. Show and label an alternate access with an arrow pointing into the lot and labeled "construction entrance". Note on the site plan: "A separate special use permit shall be obtained from the street right-of-way owner for a construction entrance before any construction accesses the work site".
- Licensed (bonded and insured) Electrical, Mechanical, and/or Plumbing (MEP) Contractors may sign on to a residential building permit application; as long as each trade's proposed new work is provided in the drawings. When any of the Contractors sign on to a Building Permit Application before it is approved and issued, the application and permit becomes an Integrated Permit.
- All plumbing and electrical work must be performed in accordance with St. Louis County Codes and Ordinances by licensed master plumbers and licensed electrical contractors, or by a pre-authorized homeowner who by examination has demonstrated the knowledge and ability to perform the work. All mechanical work must be performed by a licensed contractor authorized to do mechanical work. Homeowners may perform their own mechanical work within their own dwelling with no requirement to be licensed.
- Structural alterations proposed may be required to be drawn by a Missouri registered Design Professional and submitted as a properly sealed **electronic**. Properly sealed calculations may also be required. Only altered structure shown in issued permit drawings shall be provided in the field, and NO other existing structure shall be removed or modified. If the Field Inspector finds otherwise, a separate permit application submitted with ***/****properly sealed structural drawings and calculations shall be required for review and approval of the additional new work.
- **Structural** drawing sets, where required, shall be properly sealed by a Missouri registered architect or engineer. The top sheet of each submittal set shall be **electronically** dated and stamped **electronically** signed by the registered design professional. Subsequent sheets in the set shall have the design professional's **electronic** 1-3/4" diameter seal. The drawing sets shall bear the name, business and email addresses and contact number of the architect or engineer (*B107.1; SLCO Policy*).
- **Structural calculations**, where required, shall have a dated cover page with the proper **electronic** seal, and **electronically** signed by the registered design professional. Subsequent pages shall be sequentially numbered and totaled each page, starting with the cover as page 1. The cover page

shall have the name, address and contact/phone number of the registered design professional (*R301.1; R301.1.1; R301.1.3; B107.1; SLCO Policy*).

- The Plan Reviewer may determine the proposed work, construction, or conditions require additional information be submitted to Code Enforcement-Plan Review for review, beyond the minimum submittal requirements noted in this Checklist.

Submittal Requirements: Drawings, Notes & Zoning



Submit the following drawings and documents with a permit application to provide a **Basement Finish** in Unincorporated St. Louis County, and in those Municipalities that contract with St. Louis County for Residential Code Enforcement Services. Code and Ordinance Sections in are brackets [.].

- **Electronic Building Permit Application** filled out, signed and dated by the applicant.
- Submit **electronic** set of drawings, labeled, fully-dimensioned, and drawn to a scale, along with other documents as noted below (*B107.2.1; SLCO Policy*):
 1. **Municipality Zoning approval:** Submit **electronic** set of the plans that have each been **electronically** stamped-Approved, signed dated by the Municipality's Zoning Officer, and submit the completed Zoning application form that has been Approved, signed and dated by Zoning Officer.
OR
 2. **Unincorporated St. Louis County Zoning approval:** Submit **electronic** set of plans with the new work dimensioned and highlighted or noted to distinguish it from existing-to-remain components.
 - a. If an emergency escape well is required or is proposed as part of the new work, submit **electronic** set of site plans with its location shown and labeled. Dimension the escape well width and projection from the face of the house. Dimension the escape well's distance from the closest lot line and walking surfaces, such as a patio.
 - b. The site plan is to provide lot layout with property lines dimensioned; North arrow direction shown; lot number and subdivision name noted. Also dimension and any label setbacks and easements near or at the escape well location.
 - c. If a bedroom or sleeping area is proposed as part of the new work, and the residence has an existing on-site sanitary sewage disposal system (leach field of septic system) and/or well, show and label the locations of the septic system tank and leach field.
 3. **Architectural Drawings:**
 - **Framing Plans** of each floor and of the ceiling and roof construction. Show and label framing members, their size(s), quantities, spacing, and grades. Drawing scale 1/4" = 1'-0" typical.
 - **Interior Finish** Plans with Plumbing, Electrical and Mechanical work shown and labeled. Dimension the new work area, and dimension and label the individual rooms and spaces. Dimension the length and depth of any new work built-in cabinets, scale 1/4" = 1'-0" typical.
 - **Construction/Assembly & Structural Connection Details**, scale 1/2" to 1-1/2" = 1'-0".
 4. See **Electrical Requirements Section** in this checklist for minimum information to be provided in the **electronic** set of drawings required.
 5. See **Plumbing Requirements Section** in this checklist for minimum information to be provided in the **electronic** set of drawings required.

6. See **General Mechanical, Fuel Gas, & HVAC Requirements Section** in this checklist for minimum for information to be provided in the **electronic** set of drawings and documents required.

- See the **example drawings at the end of this checklist** for reference in completing your own project-specific drawings. The lists below are Code and Ordinance requirements for Residential Basement Finishes that are to be provided in your drawings and notes.

Design, Construction & Finish Requirements



The following are minimum requirements for a basement finish that are to be noted and provided in drawings submitted for a permit, as applicable:

Rooms & Room Dimensions

- Each habitable room (not bathrooms) shall be 70 sq. ft. minimum and shall not be less than 7'-0" in any horizontal dimension (*R304.1; R304.2*).
- A single-occupant bedroom shall be 70 sq. ft. minimum. For multiple bedroom occupants, provide minimum 50 sq. ft. per occupant (*PM404.4.1*).
- Rooms that are shown with closets, or resemble a bedroom, or can be easily converted to a bedroom, will be reviewed for bedroom requirements, regardless of the room name noted on the drawings (*SLCO Policy*).
- Ceiling heights shall be minimum 7'-0" in basement bedrooms and in hallways. Ceiling heights shall not be less than 6'-8" in basement habitable spaces used for laundry, study, or recreation and in bathrooms or half-baths. Clear heights under ceiling projections shall be not less than 6'-4", and the projections shall be spaced at least 4'-0" apart (*R305.1; PM404.3; SLCO Policy*).
- Passage between habitable spaces and bathrooms must have minimum opening wide enough to accommodate a 2'-4" door leaf (*SLCO Policy*).
- Hallway minimum clear width is 3'-0" (*R311.1; R311.6; SLCO Policy*).

Structural Framing

- Existing interior walls removed or modified must be shown and labeled as bearing or non-load bearing. Alterations proposed to bearing walls, beams and/or columns must be justified as structurally adequate in submitted structural drawings and calculations professionally sealed by a Missouri architect or engineer (*R301.1; R301.1.1; R301.1.3*).
- Alterations to existing basement exterior wall framing must comply with the following Table requirements or properly sealed drawings and calculations must be submitted. The studs below shall be standard grade or better:

STUD SIZE (inches)	Laterally unsupported stud height (feet)	Maximum spacing when supporting roof and ceiling only (inches)	Maximum spacing when supporting one floor, and roof and ceiling (inches)	Maximum spacing when supporting two floors, roof and ceiling (inches)	Maximum spacing when supporting one floor only (inches)
2 x 4	10	24 ^a	16 ^a	---	24
2 x 6	10	24	24	16	24

Wall Bracing to Resist Lateral Wind Forces

Alterations to Existing Exterior Frame Walk-Out Basement Walls Openings

- Existing-to-remain openings with no increase in width may have removed the wall portion between opening and floor. Window openings may change to door openings by removing the knee walls.
- The following alterations are allowed in the frame exterior walls without the submittal of ***/****sealed drawings and calculations justifying the altered wall's resistance to lateral wind loading:
 1. A single new opening, or multiple new openings totaling not more than 6'-0" in width; or
 2. A single new opening, or multiple new openings with a total width of 20'-0" maximum, and the total opening width is less than 50% of the length of the wall or the length of the braced wall line
- Opening alterations other than a. and b. above require the following be submitted to show the exterior wall that is altered is adequate to resist the lateral wind loads:
 1. Drawings that show new work shall comply with St. Louis County's "Basic Bracing Guideline for 1-and 2-Family Dwellings" found under the "Guides" link at: <https://stlouiscountymo.gov/st-louis-county-departments/transportation-and-public-works/residential-building/>
OR
 2. Drawings that show new work shall comply with Section R602.10 of the 2015 International Residential Code. See St. Louis County's "Appendix A1 Wind and Seismic Bracing Guideline For 1-and 2-Family Dwellings and Townhouses" for additional explanation of the 2015-IRC's bracing requirements. It is located under the "Guides" link at: <https://stlouiscountymo.gov/st-louis-county-departments/transportation-and-public-works/residential-building/>
OR
 3. Properly sealed drawings and calculations from a Missouri registered design professional, following 'Accepted Engineering Practice', in which compliance with the requirements of the 2015 International Building and its referenced standards is demonstrated.

Wall Assemblies - Interior

- Basement foundations in finished rooms or spaces must be furred-out full-height, with minimum 2x4 wood studs at maximum 24" o.c. with bottom and top plates and cavities filled with minimum R-15 insulation, and finished with minimum 1/2" gypsum board. Bottom plate shall be treated to resist rot and decay.
- Non-load bearing partitions shall be minimum 2x4 framing at 16" or 24" o.c. with minimum 1 bottom and 1 top plate and minimum 1/2" gypsum board finish both sides (*R702.3; R702.3.2*).
- Interior finish materials shall have maximums 200 flame spread index and 450 smoke development index (*R302.9*).
- On tub and shower floors and walls provide a **non-absorbent finish**. Tub and shower walls shall have minimum water resistant gypsum board (like green-board, which is paper-faced) or a backer board that extends minimum 6'-0" above the shower or bathtub floor (*R307.2*).
- On tub and shower walls with the following conditions, provide fiber-cement, fiber-mat reinforced cement, glass mat gypsum backers and fiber-reinforced gypsum backers (*R702.4; R702.4.2*):
 1. Behind wall panels in shower areas;
 2. Tile or panel applications that have grouted joints;
 3. Heavier finish materials – like tile, polished stone, or synthetic stone - that require base boards of greater strength than water resistant gypsum board (commonly called 'green board').
- A vapor barrier behind the tub or shower base board at exterior walls is prohibited (*R702.3.7*).

Fireblocking

- Provide fireblocking of 2" lumber, 23/32" structural wood panel or other approved materials at the following locations (*R302.11; R302.11.1*):
 1. Vertically-placed at frame ceiling and floor levels.

2. Horizontally-placed at 10'-0" maximum intervals along the top and bottom of conventional, double stud, furred spaces and staggered stud frame walls.
 3. Vertical and horizontal concealed connections in soffits, dropped and cove ceilings.
 4. Between stairway stringers at the top and bottom of the run. Provide in accessible enclosure under stairs 1/2" gypsum board on the underside stair surface, walls and any soffits (R302.7).
 5. Openings around vent, pipe, duct, cable and wire penetrations of ceilings and floors.
 6. Spaces between a chimney and the floor or ceiling assembly through which the chimney passes. Fireblocking shall be approved noncombustible material, such as batt or blanket mineral wool or glass fiber, securely fastened, self-supporting or on metal or metal lath strips (R1003.19).
- Materials approved for use as fireblocking are as follows (R302.11.1; R302.11.2):
 1. 2x nominal lumber.
 2. 2 thicknesses of 1x nominal lumber with broken lap joints.
 3. 23/32" wood structural panel with joints, backed by 23/32" wood structural panels.
 4. 3/4" particleboard with joints backed by 3/4" particleboard.
 5. 1/2" gypsum board.
 6. 1/4" cement-based millboard.
 7. Mineral wool batts or blankets installed to securely retain in place (R302.11.1.1).
 8. Glass fiber batts or blankets installed to securely retain in place (R302.11.1.2).
 9. Cellulose insulation installed as tested in accordance with ASTM E 119 or UL 263 for the specific application. Loose-fill insulation is not allowed, unless 2015-IRC requirements are met (R302.11.1.3).

Stairs, Guards, Handrails – Interior

- If alterations are proposed to existing basement stairs, the stairs may then be required to comply, in part or fully, with the following list of Code minimums. The extent of compliance is based on the extent of the alterations proposed and the limits imposed by existing conditions:
- Stairway minimum clear width is 36". Only handrails may invade the minimum clear width as follows:
 10. Minimum clear width at and below handrail height is 31-1/2" with handrail on 1 side;
 11. Minimum clear width is 27" with a handrail on both sides (R311.7.1).
- Stairway headroom minimum height is 6'-8", measured vertically from the tread nosing and from the floor surface of a landing or platform. See R311.7.10.1 for spiral stairs headroom (R311.7.2).
- Show quantity and stringer size (2 x12 minimum) and note tread material and its thickness. Stairs must support a 40-psf live load or 300-lbs. concentrated load acting on 4 sq. inches at mid-span of tread, whichever produces the greater stresses and deflections (Table R301.5; SLCO Policy).
- Maximum riser height is 7-3/4" and the minimum tread depth (measured horizontally from tread nosing to tread nosing) is 10". The greatest riser height shall not exceed the smallest by more than 3/8" within a single flight of stairs. A nosing projection of at least 3/4" and not more than 1-1/4" is required on stairways with solid risers (R311.7.5).

Exception: A nosing projection is not required where the tread depth is at least 11" (R311.7.5.3).
- Open risers are allowed as long as openings located more than 30" above adjoining floor or grade do not allow passage of a 4" sphere (R311.7.5.1).
- In any enclosed accessible space under the stairs, provide walls, the under-stair surface, and any soffits with minimum 1/2" gypsum board (R302.7).
- Show and note at least 1 continuous handrail that is 34" to 38" measured vertically above a line connecting the leading edges of the stairs' tread nosing for stairs with 4 or more risers (R311.7.8; R311.7.8.1).

- Provide handrails that are continuous for the full run of a stair flight. Handrails ends return to the wall or newel post (*R311.7.8.2*).

Exception:

1. A handrail may be interrupted by a newel post at a turn.
2. A volute, handrail turnout, starting easing or starting newel is allowed over the lowest tread.

- Handrails and projections below handrail shall project 4 -1/2" maximum into required stairway width. Provide 1-1/2" clear space between a wall and the handrail (*R311.7.1; R311.7.8.2*).
- Guards shall be minimum 34" measured vertically above a line connecting the leading edges of the stairs' tread nosing. Guards shall be minimum 36" measured vertically above open-sided walking surfaces like stair landings, where open-sided stairs are more than 30" above the adjoining floor or grade (*R312.1.2*).
- Required guards for a stair flight shall not have any openings provided from the stair tread surface to the required guard height that allows the passage of a sphere 4" in diameter (*R312.1.3*).

Exception:

1. The triangular opening formed by the riser, tread, and bottom rail of a required guard shall not allow passage of a sphere 6" in diameter.
2. Required guards shall not have any openings provided from a walking surface to the required guard height that allows the passage of a sphere 4" in diameter.

Insulation & Energy Conservation

- Show and note the type, thickness and R-value of insulating materials at locations required by the Code (*N1101.5; N1101.5.1; SLCO Policy*).
- Insulation already existing in exposed exterior framing may remain. If no insulation exists, then provide minimum R-15 insulation with vapor retarder in exterior frame walls, and minimum R-38 insulation in ceilings with unconditioned space (*R702.7; SLCO Rev. Ord. N1101.5; Table N1102.1.2*).
- Provide batt or blanket insulation and their facings - vapor retarders or other vapor permeable membranes left exposed in areas like unfinished basements - with a maximum 25 flame spread rating and a maximum 450 smoke development rating. Facings that are verified as installed in substantial contact with the concealed finish surface of a ceiling, floor, or wall need not comply with flame spread and smoke development limits (*R302.10*).
- Provide foam plastics with a maximum flame spread rating of 75 and a maximum smoke development rating of 450 per ASTM E84 or UL 723 (*R316.3; R316.6*).
- Show foam plastic insulation is separated from the building interior by an approved thermal barrier, like 1/2" gypsum wallboard or 23/32" wood structural panel (*R316.4*).
- Show and label in wall and building sections the type, thickness and "R" value of insulating materials. Note the "U" values of windows, doors, and skylights in the drawings. R-values noted must be only for the insulation material used, not for the total system assembly (*N1101.5*).

MINIMUM INSULATION (R-Values) & MAXIMUM FENESTRATION (U-factors & SHGCs) REQUIREMENTS <i>(SLCO Rev. Ord. Table N1102.1.2)</i>	
Wood Frame Walls & Band Joists/Boards Wood Frame Walls adjoining exterior or	R-15

MINIMUM INSULATION (R-Values) & MAXIMUM FENESTRATION (U-factors & SHGCs) REQUIREMENTS (SLCO Rev. Ord. Table N1102.1.2)	
unconditioned spaces, including Walkouts	
Concrete/Masonry Basement Foundation Walls: For Unfinished Basement Areas For Finished Basement Areas	R-5¹ R13
Slab-On-Grade Floors ²	R-10 no ductwork in slab R-15 ductwork in slab
Access ^{3,4} Doors & Hatches (SLCO Rev. Ord. N1102.2.4)	Insulate Equal to R-Value of Surrounding Wall or Ceiling Insulation R-value
Fenestration U-Factor (Includes Doors; Excludes Skylights)	0.34 Max.

1. **Exception:** Unfinished basements shall not have more than 20% of the total basement wall area as exposed un-insulated concrete foundations above the outside finished grade/ground level:
 - a. Determine the foundation wall area above outside grade allowed to be un-insulated, using the formula $0.20 \times H_{max} \times P_{bew}$. See next item for explanation.
 - b. Translation: 20% of the maximum height 'H' of all basement exterior walls, including insulated exterior frame walls for walk-out basements and walls common to both basement and attached garages - x the perimeter 'P' of the 'bew' basement exterior walls.
 - c. In unfinished basement areas, foundation walls exposed above outside finished grade in excess of 20% of the total basement wall area shall have minimum R-5 insulation. Extend the insulation down to the basement floor slab, or extend at least 24" below the outside grade that is above the floor slab.
- Show and label an approved air barrier separating showers and tubs from adjacent exterior wall framing and its insulation (SLCO Rev. Ord. Table N1102.4.1.1).

Light & Ventilation

- Glass area in habitable and occupiable rooms shall be minimum 8% of floor area served. Area required to open to the outdoors shall be 4% of the floor area served (R303.1; R303.2).
- Provide natural ventilation net free air to unfinished basements and utility rooms at minimum 1% of the floor area served, OR provide mechanical ventilation with outdoor air only, NOT recirculated air, in compliance with the International Mechanical Code at a rate of .05 cfm/sq. ft. of area (SLCO Policy).

Emergency Escape Openings

- The finished basement, or each of its bedrooms and sleeping rooms where provided, shall have an emergency escape opening that meets the following minimums (R310):
 1. Maximum height to bottom of clear opening - 44"
 2. Minimum clear opening width - 20"
 3. Minimum net clear opening height - 24"
 4. Minimum net clear opening area - 5.7 sq. ft.
 5. The required net clear opening area shall be met by normal window operation from inside dwelling, and shall not require the use of keys, tools or special knowledge;
 6. Grade floor or below-grade windows may have a net clear opening of minimum 5 sq. ft.

Exception: Where finished basements will not have bedrooms or sleeping rooms and none exist in the basement, smoke alarms provided in the basement and house in compliance with the requirements of 2015-IRC Sections R314 and R315 may be provided in place of the emergency escape opening. Carbon monoxide alarms must also be provided where a gas appliance exists or is provided in the residence, or an attached garage exists. See the Smoke and Carbon Monoxide Alarms Section of this checklist for their requirements and locations in the residence (*SLCO Policy*).

- Show in the drawings compliance with the above by 1 of the following methods (Only showing the rough frame opening for windows is not acceptable):
 1. A window schedule noting the net window openings, net glass area and each window type, and number and key each to its location in the plans; OR
 2. Note on the plans at each location the net opening, net glass area and window type; OR
 3. Note on the plans at each location the specific manufacturer and window's sizing Code Number.
- Note the clear opening height above the floor level and note sizes of windows on elevation drawings.
- The emergency escape well must be minimum 9 sq. ft., 36" x 36" clear in horizontal area and be large enough to allow a swinging emergency escape window to fully open. Where located under decks or porches, provide minimum 36" clear height over the entire well and a continuous path to an open yard or court. See this Guide's Plumbing Section for window well drain requirements (*R310.2.3; R310.2.4*).
- Emergency escape wells deeper than 44" must have a permanent ladder or steps. Ladders or steps shall extend 6" maximum into the minimum clear space dimensions of the escape well. The ladder must be at least 12" wide, project minimum 3" from the well wall and have rungs vertically-spaced maximum 18" o.c. the full height of the escape well wall (*R310.2.3; R310.2.3.1*).
- For emergency escape wells deeper than 48", submit properly sealed structural calculations verifying the escape well structure shall retain soil to the well height proposed (*R301.1.3; SLCO Policy*).

Exceptions:

 1. Submit a current, valid ICC-ES Research Report that verifies the escape well is structurally adequate to retain soils to the well wall height/depth proposed (*B104.11; B1604; B1807.2*); AND
 2. The proposed emergency escape well model number and manufacturer is provided in the drawings properly sealed the Missouri Registered Architect or Engineer (*B107.2.1*).
- A 36" high guard, with openings not more than 4", is required to separate a path, drive, walking surface within 24" of the high side of a window well deeper than 48". Provide guard between a window well deeper than 30" and an adjacent to a patio slab or deck. Locate window well so a guard is not required around the entire well (*R312.1.3; SLCO Rev. Ord. R312.1.1*).
- Provide sizes of windows and note sill height above floor in elevation or plan views (*SLCO Policy*).

Safety Glazing

- Glazing in locations noted below shall be tested and labeled in accordance with CPSC 16 CFR Part 1201 Standard as a Type I or II category. Provide safety glazing in sliding doors and for any glazing more than 9 square feet. Glazing in doors and enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs, and showers shall be a Type II category and so noted on the sealed plans (*R308*).
- **Notice:** Glazing tested in accordance with ANSI Z97.1 may be provided in hazardous locations other than in enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs, and showers. Provide Type B glazing in place of Type A for a glass pane area less than 9-sq. ft. and Type A for sliding glass doors and glazing more than 9-sq. ft. (*R308.3.1-Exception; Table R308.3.1(2)*).
- Provide sizes of all glazed openings and windows, the dimensioned height of glazing bottom edge above the floor, and the horizontal distance from glazing door edge, to verify the required locations of Type I or II safety glazing as follows (*B107.2.1; R308.3.1; R308.4; Table R308.3.1(1); SLCO Policy*):

1. Glazing in doors, fences, and enclosures of bathtubs, showers, hot tubs, whirlpools, saunas, steam rooms, spas, indoor or outdoor pools where glazing is 60" or less, measured horizontally, from the water's edge and less than 60" vertically above a standing surface (*R308.4.5*).
2. Glazing material less than 60" above the floor and a) in the same plane as, and within 24" of, either side of a closed door OR b) is in a wall perpendicular to a closed door and within 24" of the hinge-side of an in-swinging door (*R308.4.2; SLCO Policy*).

Exceptions:

- a. Decorative glass.
- b. A wall or other permanent barrier is between the door and the glazing.
- c. Glazing adjacent to a closet door serving a storage area 3'-0" or less in depth. Glazing shall comply with Section R308.4.3.
- d. Glazing adjacent to the fixed panel of patio doors.
- e. Glazing in walls on latch side of, and perpendicular to, the plane of a closed door.

2. Glazing in fixed or operable panels that meet all of the following (*R308.4.3; Table R308.3.1(1)*):
 - a. Individual pane larger than 9 sq. ft. and;
 - b. Bottom edge less than 18" above floor and;
 - c. Top edge more than 36" above floor and;
 - d. Walking surface within 36" measured horizontally.

Exceptions:

- 1) Decorative glass.
- 2) A 1-1/2" height rail placed 34"-38" above walking surface on accessible side of glass. Rail shall withstand minimum 50-lbs. per linear foot horizontal load with no glass contact.

3. Glazing in all doors fixed or operable, swinging, sliding, or bi-fold (*R308.4.1*):

Exceptions:

- a. Glazed opening in a door through which a 3" diameter sphere cannot pass.
- b. Decorative glass.

4. Glazing in guards and railings, regardless of area or height above a walking surface (*R308.4.4*).

5. Glazing with bottom edge less than 36" above, and adjacent to, the walking surface of stairways, landings between stairs, and ramps (*R308.4.6*).

Exception: A 1-1/2" height rail placed 34"-38" above walking surface on accessible side of glass. Rail shall withstand minimum 50-lbs. per linear foot horizontal load with no glass contact.

6. Glazing with its bottom edge adjacent to and less than 36" above the bottom landing of stairs, and within a 60" horizontal arc that is less than 180-degrees from the bottom tread nosing (*R308.4.7*).

Exception: A guard complying with R312 is provided on the accessible side of the glass, and is located more than 18" away from the glass plane.

- Glazing exempted from requirements for hazardous locations are louvered windows and jalousies minimum 3/16" thick, maximum 48" long, with smooth exposed edges (*R308.2; R308.3; R308.4*).

Factory-Built Fireplaces & Chimneys

- Provide plan and section drawings of construction and assembly of prefab fireplace installation and its enclosing walls interior and exterior, and any new work hearth. Provide minimum R-15 insulation in exterior walls.
- **Notice:** See the St. Louis County checklist Single Family Dwelling Design as a Code guide to requirements for All-Masonry Fireplaces and Chimneys.
- **Notice:** See the St. Louis County checklist Factory-Built Fireplaces, Chimneys & Fireplace Stoves for more information regarding permit requirements.
- **Notice:** Install gas fireplaces, gas logs, and gas room heaters in accordance with 2015-IRC Chapter 24. Provide combustion air shall in accordance with Section G2407.

- **Notice:** Install unvented gas log heaters only in those factory-built fireplaces specifically tested, listed and labeled for such use in accordance with UL-127 (*R1004.4*).
- Provide the name of the pre-fab fireplace manufacturer and the make and model number directly on the plan. Submit an **electronic** set of the pre-fab fireplace manufacturer's installation manual that provides the appliance's proof of testing per UL-127 by a nationally recognized testing agency (*SLCO Policy*).
- Fireplace exterior combustion air duct(s) must be listed by the manufacturer as a component of the fireplace and shall be installed per the manufacturer's installation instructions, or the exterior combustion air duct(s) provided shall be an approved equivalent (*SLCO Rev. Ord. R1006.1.1*).

Bathroom Requirements

- Show, label and space bathroom fixtures as required by the IRC and UPC, and note the stud size of plumbing chase walls or note the dimensions of chase clear space (*B107.2.1; SLCO Rev. Ord. R307.1; P1103.P-136; SLCO Policy*).
- Show and dimension minimum (min.) 15" clear width from side wall, tub edge or shower threshold to a toilet's centerline. Show and dimension min. 30" clear between centerlines of the toilet and an adjacent fixture. Provide 21" – 24" min. clear space in front of water closets and lavatories. Accessory items such as paper dispensers and grab bars are not clear space obstructions (*P402.5; SLCO Rev. Ord. R307.1*).
- Provide minimum 1024 sq. in. interior shower space of any shape, into which a 30" diameter circle shall fit up to 70" minimum above the shower drain outlet (*P408.6*).
- Shower threshold shall accommodate a minimum 22" width door, and the shower door must open to provide a minimum 22" opening for unobstructed egress (*P408.5*).
- Provide non-absorbent finish on tub and shower floors, and on walls of minimum water resistant gypsum board (like green-board, which is paper-faced) or backer board and extend minimum 6'-0" above the shower or bathtub floor. (*R307.2*).
- Water resistant gypsum board (aka 'green board') cut or exposed edges shall be sealed per manufacturer instructions. (*R702.3.7*).
- Do not use water resistant gypsum board (aka 'green board') as backing for non-absorbent finishes where (*R702.3.7.1*):
 1. The space is subject to continuous high-humidity.
 2. The finished surfaces are in direct contact with water.
 3. The grout joints may crack and let moisture reach the gypsum board surface.
 4. Instead, use boards noted below as base for finishes.
- Provide fiber-cement, fiber-mat reinforced cement, glass mat gypsum backers and fiber-reinforced gypsum backers Install per manufacturer recommendations for (*R702.4; R702.4.2*):
 1. Enclosure walls of tubs and showers and behind wall panels in shower areas.
 2. Tile or panel applications that have grouted joints.
 3. Heavier finish materials – like tile, polished stone, or synthetic stone - that require base boards of greater strength than water resistant gypsum board (also called 'green board').
- A vapor barrier behind the tub or shower base board at exterior walls is prohibited (*R702.3.7*).
- Water resistant gypsum backing board minimum 1/2" thick allowed on ceilings with framing at maximum 12" o.c., OR 5/8" thick with framing at maximum 16" o.c. Cut or exposed edges shall be sealed as per manufacturer recommendations (*R702.3.7*).

- For new or altered windows, show the total clear glass area is at least 3% of a finished room's floor area. Show at least 1/2 of the required glass area is openable to outside air for unobstructed ventilation with screens included. Exception: Equivalent artificial light and mechanical ventilation from a whole-house HVAC system is provided (*R303.3; M1507*).

Smoke & Carbon Monoxide Alarms



- Show and label in the drawings the locations of smoke alarms and carbon monoxide alarms in the basement.
- Where basements are finished and/or other new work is performed in the residence, the house smoke and carbon monoxide alarm systems must be verified as or made Code-compliant as follows:
 1. Smoke alarms AC powered with battery backup, compliant with NFPA 72, and listed per UL 217 (*R314.1; R314.1.1*).
 2. Smoke alarms outside each sleeping area in the immediate vicinity of the bedrooms and in each sleeping room. Bedroom hallway alarm upstream from any return air grille. Smoke alarms on floor levels without bedrooms, including basements and habitable attics. In split level dwellings without a door between the levels, a smoke alarm placed on the upper level will cover an adjacent lower level that is less than 1 full story below the upper level. Provide a smoke alarm on both levels where a door intervenes between them, or the levels are 1 full story apart (*R314.3*).
 3. Interconnect devices so activation of 1 alarm will activate all alarms in the dwelling (*R314.4*).
 4. Carbon monoxide alarm outside each sleeping area and bedroom; between sleeping area and fuel-fired appliance in same room or in a bathroom that opens to sleeping area (*R315.2; R315.3*).
 5. Carbon monoxide alarms listed per UL 2034, wired to the dwelling's power system served from a commercial source, and with battery backup. Combination carbon monoxide/smoke alarms listed per UL 217 (*R315.1.1*).

General Mechanical, Fuel Gas & Heating, Ventilation, Air Conditioning (HVAC) Requirements



The following minimum requirements are to be noted and provided in drawings submitted for a permit:

Habitable Rooms

- Provide an **electronic** mechanical plan layout of the Basement Finish area. Show and label the locations and sizes of any new work ducts extending off of the existing residence HVAC system and their S/A & R/A diffusers. Show locations and sizes of high-and-low transfer air grilles in mechanical room enclosure walls, where required to provide adequate combustion-ventilation-dilution air.
- If PTACs, mini-splits, baseboard units, or other acceptable heating/cooling systems are proposed, provide plan layouts of their location(s) and complete plan/ sections of their installation into/through the building structure. Also submit heat gain/loss load calculations for the area to be served and the capacity and specifications for the heating/cooling system proposed.

Bathroom

- Provide bathrooms and toilet rooms with minimum 50 CFM fan exhausted to exterior. Fan may discharge through attic gable vent or soffit vent, if its duct is attached to structure or secured without obstruction within 6" of the vents.

Notice: Recirculation of air from bathrooms and toilet rooms is prohibited (*M1507.4; SLCO Rev. Ords. R303.3; M1501.1-Exception 2; M1507.2*).

- **Exception:** Bathrooms and toilet rooms provided with minimum 3.0 sq. ft. of natural light, of which 1/2 is openable, shall not require mechanical ventilation. Both natural light and natural ventilation requirements must be provided (*SLCO Rev. Ord. R303.3*).

Laundry Room or Area

- Show and note clothes dryer exhausts to the exterior through smooth, 4" min. diameter, 0.016" thick metal duct that is independent of other systems, is supported every 4'-0".
- and is secured in place. Maximum developed exhaust duct length is 35'-0" from the dryer's transition duct to the outlet terminal (*G2439.1; G2439.7.1; G2439.7.2; SLCO Rev. Ord. G2439.7.4.1; M1502.4.5.1*).

Electrical Requirements



The following minimum requirements are to be noted and provided in drawings submitted for a permit:

Show location of all receptacles, switches, lights, ceiling fans, and exhaust fans on floor plans. Identify all 240 volt receptacles/circuits. Provide/draw curved lines from wall switches and lighting receptacles to the lights they each control (*B107.2.1; SLCO Policy*).

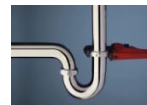
Receptacles

- Receptacle outlets are required in the minimum quantities as follows (*E210.52*):
 1. In habitable rooms so no space along a wall is more than 6'-0" from a receptacle (bathrooms not included), and in wall spaces 2'-0" wide or more. Include in the 6'-0" measurement fixed panels of glass doors and fixed room dividers such as free standing bar-type counters or railings.
 2. In hallways 10'-0" or more in length. A foyer is considered an entry hallway.
 3. In bathrooms, 1 wall-mounted receptacle within 36" of each basin rim (*E210-52(D)*).
 4. In laundry room/space, at least 1 receptacle supplied by a dedicated 20 ampere branch circuit.
 5. In separate unfinished basement areas, minimum 1 receptacle.
- Provide ground-fault circuit-interrupter (GFCI) protection to 125 volt, single phase, 15 and 20 ampere receptacles as follows (*E210-52(A)(B)(C)(D); E210.8(B)(2); E210.8(D)*); *SLCo Rev. Ord. E210.8*):
 1. Bathroom, within 36" of the edge of each lavatory basin.
 2. Wet bar within 6'-0" of a sink rim.
 3. Unfinished basement area. Does not include the clothes dryer circuit and the single receptacle dedicated to sump pumps.
- Provide arc-fault circuit interrupter (AFCI) protection to outlet(s) with a 120-volt, single phase, 15- and 20-ampere branch circuit as follows:
 1. In bedrooms.
 2. For small appliance use (like an iron) in laundry areas (*SLCO Rev. Ord. E210.12(A)*).
- Provide a receptacle that is 3-pole with ground type for a clothes dryer (*E250-138; E250-140*).
- Receptacles within a bathtub or shower space are prohibited (*E406.9(C)*).

Lighting

- Provide lighting in the following areas (*E210.70; M1305.1.3.1; SLCO Rev. Ord. M1305.1.4.3*):
 1. At least 1 wall switch-controlled lighting outlet in each finished basement habitable room, bathroom, hallway, at/over the basement interior stairs, and at any basement exterior doors. Place wall switch near room or space entry and exterior doors(s). Occupancy sensors in habitable rooms or bathrooms may be provided in addition to a wall switch and shall be equipped with a manual override, located at the customary wall switch location.
 2. At least 1 lighting outlet and 1 receptacle in each separate unfinished basement room or area and in utility room(s) used for storage or containing heating, air-conditioning or other equipment that requires service. Locate light switch at the room or space entry.
- Verify or provide basement stairs with 6 or more risers with a wall light switch near the stairs top and bottom, unless remote, central, or automatic lighting control is provided. Stairs shall have minimum 1 foot-candle of light measured at centers of treads and landings (*R303.7; E210.70*).
- Basement exterior stairways shall have a light at entrance landing (*E210.70; SLCO Rev. Ord. R303.8*).
- Lighting fixtures above bathtub and shower spaces: No parts of hanging/pendant fixtures, track lighting and ceiling paddle fans shall be within a zone measured 3'-0" horizontally from its outside edge and 8'-0" vertically from the top of a bathtub rim or shower threshold (*E410.10(D)*).
- Lighting fixtures within the 8'-0" height restriction over the tub or shower must be marked for damp locations, or for wet locations where subject to shower spray (*E410.10(A)(D)*).
- Recessed luminaires in the building thermal envelope shall be 'I.C.' rated (Insulation Contact rated) and labeled with an air leakage limit of 2.0 cfm per ASTM E283. Seal the luminaire housing at the ceiling or wall finish with a gasket or caulk (*SLCO Rev. Ord. N1102.4.5*).
- Lighting in clothes closets (*E410.16*):
 1. Incandescent fixtures with open or partially enclosed lamps and pendant fixtures are prohibited.
 2. Locate as follows fixtures on ceiling or on wall above door and from nearest storage space:
 - a. 12" minimum clearance: Surface-mounted incandescent or LED fixtures.
 - b. 6" minimum clearance: Surface mounted fluorescent fixtures and recessed fixtures.
 3. Electrical panels (*E110.26; E240.24*):
 - a. Electrical panels in bathrooms, clothes closets, or over/above stairs are prohibited.
 - b. Allowed in bedrooms as long as clothes cannot be stored in panel enclosure w/ solid door.
 - c. Provide lighting in the vicinity of the electrical panel.
 - d. Install in areas with at least 6'-6" headroom.
 - e. Provide centered in front of electrical panel minimum clear space 36" deep and 30" wide.
 - f. Counters and cabinets installed under the electrical panel are prohibited.

Plumbing Requirements



The following minimum requirements are to be noted and provided in drawings submitted for a permit:

Exterior

Notice: If a basement bedroom, or a habitable room convertible to a bedroom, is proposed in a residence having an existing septic or other on-site sewage disposal system, contact the Plumbing Inspections Section of Code Enforcement for their review and submittal requirements. They must verify the existing septic system can handle the additional load, or require, review and approve changes be

made to it. Access the requirements on-line at <https://stlouiscountymo.gov/st-louis-county-departments/transportation-and-public-works/residential-building/>. The separate permit requirements and rules, regulations and procedures for septic systems are provided.

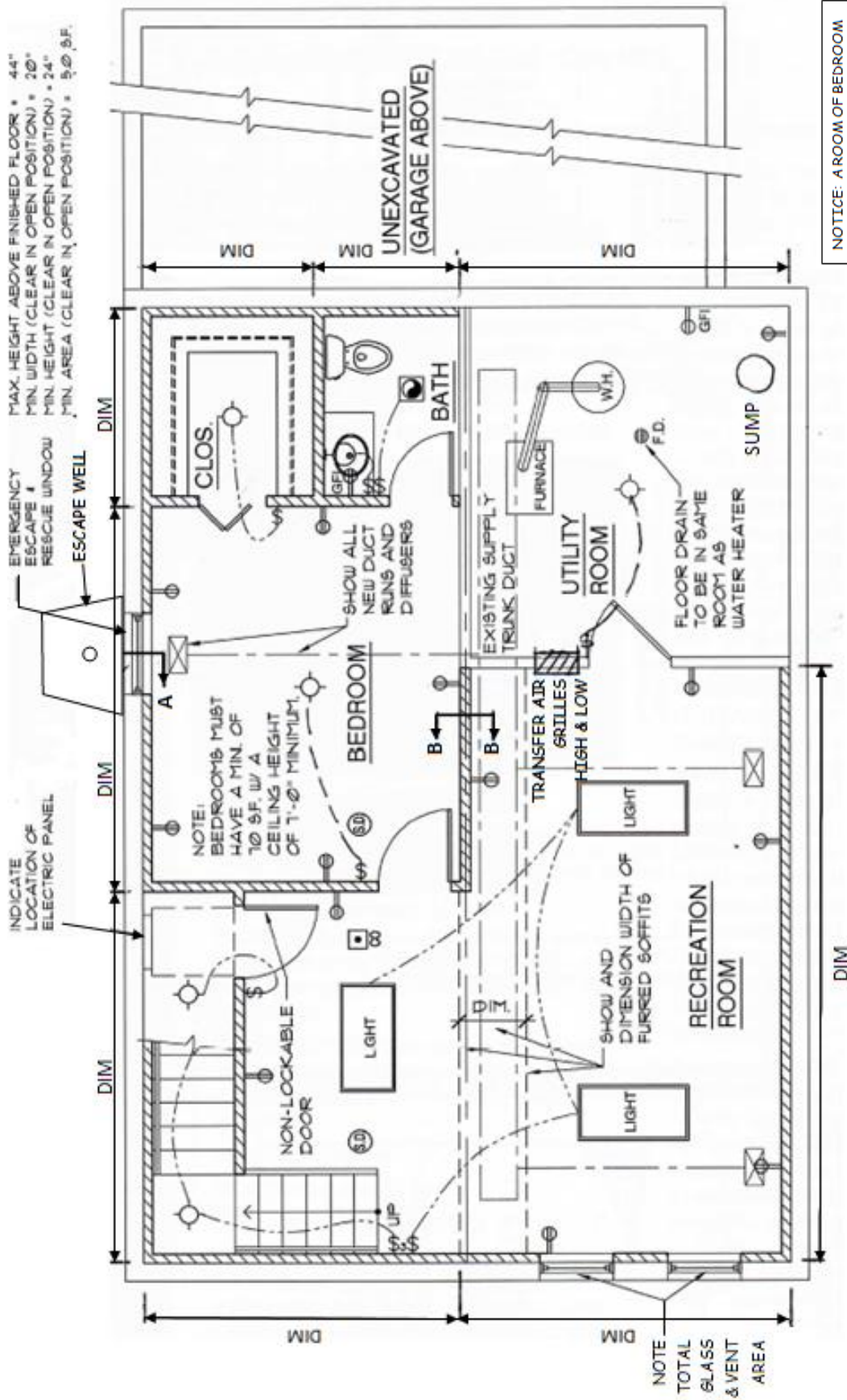
- Show and note open, below-grade basement areaways - like emergency escape wells - less than 100 sq. ft. in area shall have a 3" drain; and those greater than 100 sq. ft. shall be sized per UPC Table 1101.8 and shall not drain to subsoil (**P1101.3; P1101.6; P1101.7; SLCO Rev. Ord. 1101.8**).
- Provide a window areaway (like an emergency escape well or a light well) with the following:
 1. Where less than 10-sq. ft., provide a floor drain and 2" diameter pipe that drains to daylight, or to a sump with an approved pump installation.
 2. Where 10-sq. ft. or more, but less than 100 sq. ft., provide a floor drain and 3" diameter pipe that drains to daylight, or to a sump with an approved pump installation.
 3. Where greater than 100 sq. ft., provide a floor drain sized per Table 1101.8 of the 2015-UPC.

The drain as noted above is a requirement, whether or not a cover is provided over the areaway (*P1101.6; P1101.7; P1101.9*) – from *SFD CHECKLIST*

Interior

- Finished basements shall be verified by Inspections as having a sump, or shall be required to provide a sump (*R405.2.3; P1101.6.2*).
- Show and label sink(s), lavatories, water closets/toilets, bathtubs, showers, hot water heater(s), floor drain(s), hose bibs, plumbing chases and all other plumbing fixtures in the architectural plans (*B107.2.1; SLCO Rev. Ord. P1103.P-136; SLCO Policy*).
- Show and label the locations of the clothes-washer hose connection bib and laundry standpipe (*B107.2.1; SLCO Rev. Ord. 1103.P-136; SLCO Policy*).

Notice: The preceding requirements apply to most simple residential **Basement Finish projects**. However, the Plan Reviewer may determine the actual new work shown in the drawings requires additional information be submitted to verify Code compliance of the new work proposed. The above requirements are based on the construction Codes in effect at the time this checklist was last updated. Please be aware St. Louis County Code Enforcement updates its construction codes every few years.



FINISHED BASEMENT PLAN

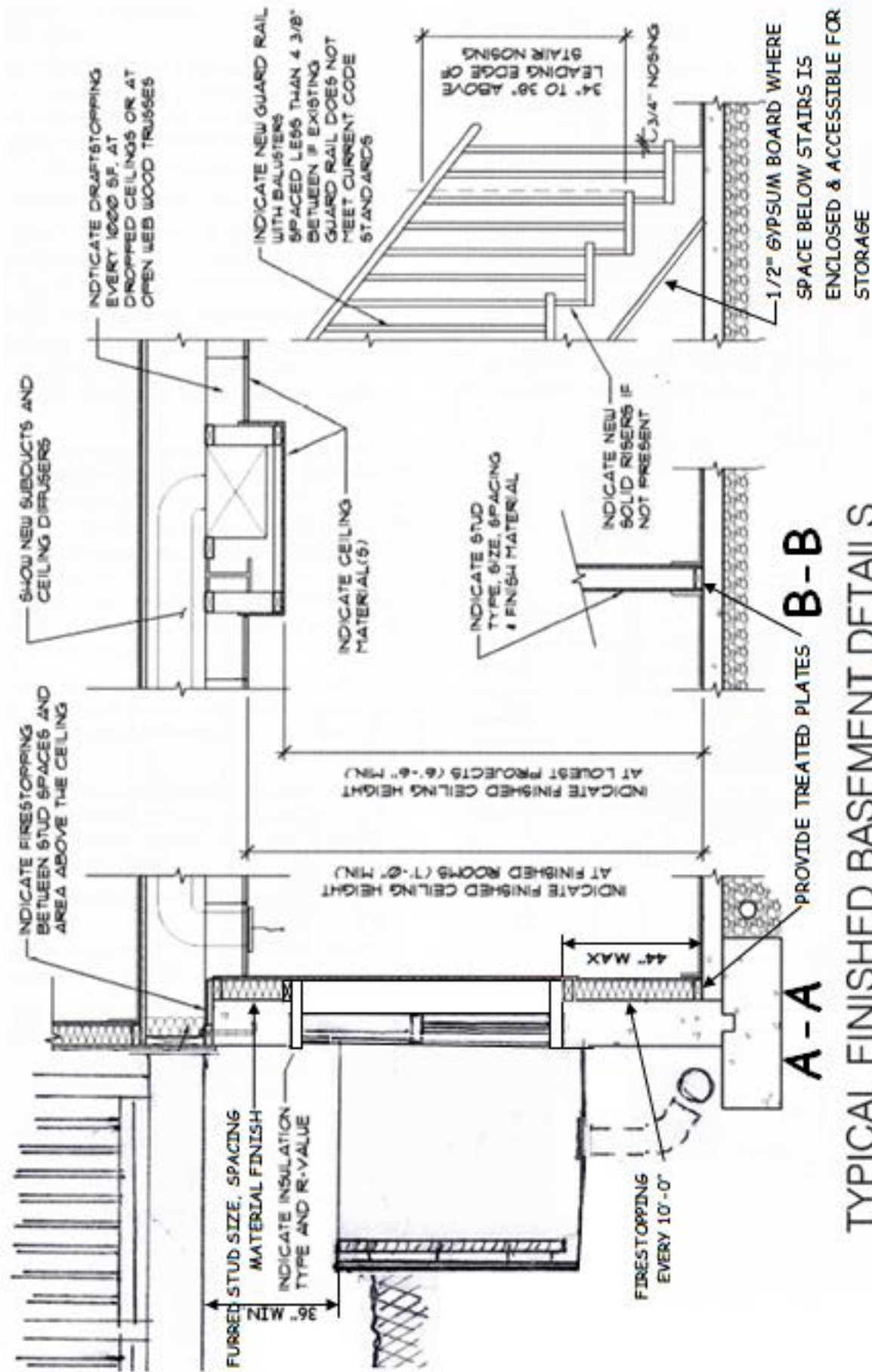
INDICATE PLAN SCALE

DRAWING LEGEND

- ▤ NEW WALL CONSTRUCTION
- ▬ EXISTING WALL TO REMAIN
- Ⓢ U.L. LISTED, INTERCONNECTED, A.C. POWERED SMOKE DETECTOR W/ BATTERY BACKUP
- Ⓢ U.L. 2034-2008 CARBON MONOXIDE DETECTOR
- ⊙ LIGHT FIXTURE
- Ⓢ LIGHT SWITCH
- ⊖ ELECTRICAL OUTLET
- Ⓢ EXHAUST FAN (MIN. 50 CFM) VENTED TO EXTERIOR

GENERAL NOTES:

1. IF GAS APPLIANCES ARE LOCATED WITHIN A NEW ROOM OR DOWNSIZED SPACE, THEN INDICATE HOW COMBUSTION AND VENTILATION AIR IS PROVIDED.
2. INDICATE NEW AND EXISTING PARTITIONS GRAPHICALLY OR BY NOTE. DIMENSION ALL NEW ROOMS/ SPACES.



TYPICAL FINISHED BASEMENT DETAILS

INDICATE DETAIL(S) SCALE