Upgrading Below-Grade Spaces: Assessing Priorities

Sam Breidenbach

[Cold climate bias]

Gap-Balancing risk and homeowner expectations

- **Managing risk and challenges for contractors**
  - Moisture, mold and liability
  - Durability/Sustainability
  - Design/build vs. owner's architect
  - Contract language to reduce liability
  - Aligning technical details with specific situations
  - Below grade spaces are business opportunities
  - Selling and Competition

Gap-Balancing risk and homeowner expectations

- **Homeowner Expectations and Priorities**
  - Focused on “house beautiful” until technical failure occurs
  - Health related issues
  - Opportunity to conserve energy
  - Cost vs. value—”inexpensive additional space”
  - Expectations not aligned with physical realities. Most often clueless as to the perils associated with work.

Assessments-Where we are today

- Most building codes have realized that a vapor retarder below grade is a bad thing--OMG!
- Some Codes defer risk to contractor to determine need for drain tile.
- Myriad technical information available
- Slowly evolving consensus on “best practices”
- One size does not always fit all

Priorities and Solutions—What we need to manage—Priority #1

- “Design, Design, Design”.
- Create a risk factor chart for different types of foundations using a scale of Low (not none), medium and high levels of risk.
- Chart should be for floors and walls
- Let the contractor work out the cost vs. risk factor with Homeowners.

Priorities and Solutions—What we need to manage—Priority #2

- “Educate, Educate, Educate”
- Provide simple to understand details on BA website in a prominent spot.
- There are typically 3 or 4 wall types, each of which have either some or no exterior water management systems.
- There is typically one or two floor types; Good or bad concrete with undetermined substrates.
- Challenge: It is not coming up with wall details but rather educating the lot of contractors doing the work to Do No Harm.
- Convince education committees at NARI and other associations to hand out details and provide training sessions for members. Provide educational blitz for Homeowners

Barriers/Risks going forward

- **Analyzing existing conditions to determine:**
  - Degree of risk
  - What detail is “non negotiable” for the level of risk—When should a contractor walk away?
  - Most cost effective solutions vs. level of risk
- **Education:**
  - **Homeowner**-Emphasize risks and limitations
  - **Contractor**-getting beyond the notion that “carpet will make your floor warmer”
- **“Do no harm—**It doesn’t get any riskier than this”

Case #1—1916 Victorian

- Retrofit drain tile sump and pump
- Two Part Spray foam over dimpled matt over rubble walls
- New perimeter wood Stud wall

Case #1—

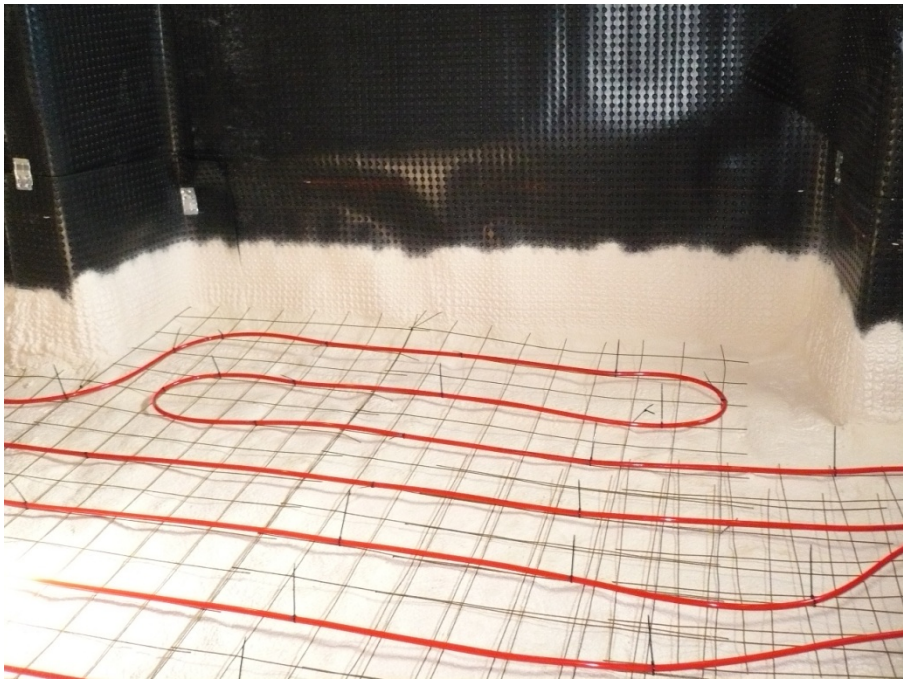
- New Mechanicals
- Extensive re-structuring of main support beams and columns.
- 6050 CFM50—VERY leaky house—20% reduction

CASE #1

Case #1—

- Replaced existing uneven and broken up concrete floor
- Excavated approximately 8” of soil
- 4” granular fill for future radon mitigation
- 2” Two-part spray foam over fill
- Radiant heat tubes over foam
- New concrete

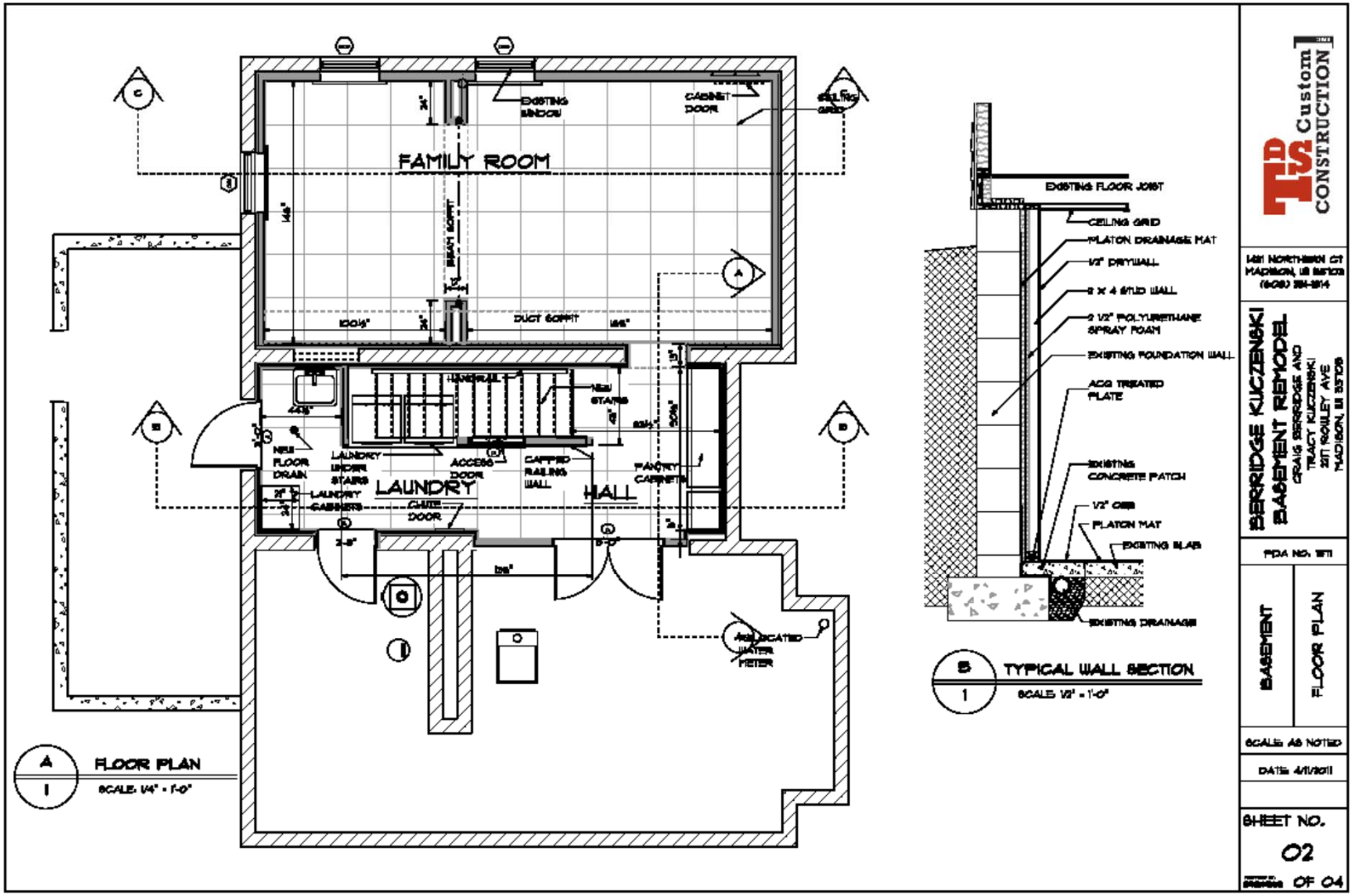
CASE #1



CASE #1

CASE #1

Case #2—1920's Bungalow--2010



Case #2--

- New Perimeter wood frame walls
- 2” Two-Part Spray foam over dimpled mat on walls
- Existing drain tile

Case #2--

- (Place holder for another set of photos)

Case #2--

- Lots of self leveling concrete
- Engineered wood flooring over ½”

OSB over dimpled matt on existing slab

Case #3- Old Queen Anne's- Circa 1920

- Two Part spray foam over existing rubble between existing framing—(No dimple mat-- owner didn't want to pay for it!!)
- No drain tile or floor treatment—Carpet over existing concrete
- 1-1/2 years later basement flooded- We were not held liable

CASE #3--CYA—Added to contract

NOTE: Old basements are inherently at risk for moisture problems. We do not advise installing carpet or vinyl directly over the existing concrete floor. We recommend the following items to mitigate the potential for future water damage to newly installed materials. [NOTE: Owner agrees to assume all risk and liability related to future moisture problems caused by bulk water seepage , condensation, and vapor diffusion without taking the following steps. None of the following items are included in the contract sum]

~Drain tile and sump pit retrofit into existing floor.

~A dimpled drainage mat over existing stone walls to allow bulk water to drain into new drain tile in floor. Spray Foam insulation would be applied over dimpled mat

~Floor: A dimpled drainage mat with plywood secured to existing concrete with 1” rigid foam over drainage mat

~~Other methods approved by professional building scientists.

Case #3

CASE #4—1917 Victorian--(2004 project- 45% reduction in air infiltration)

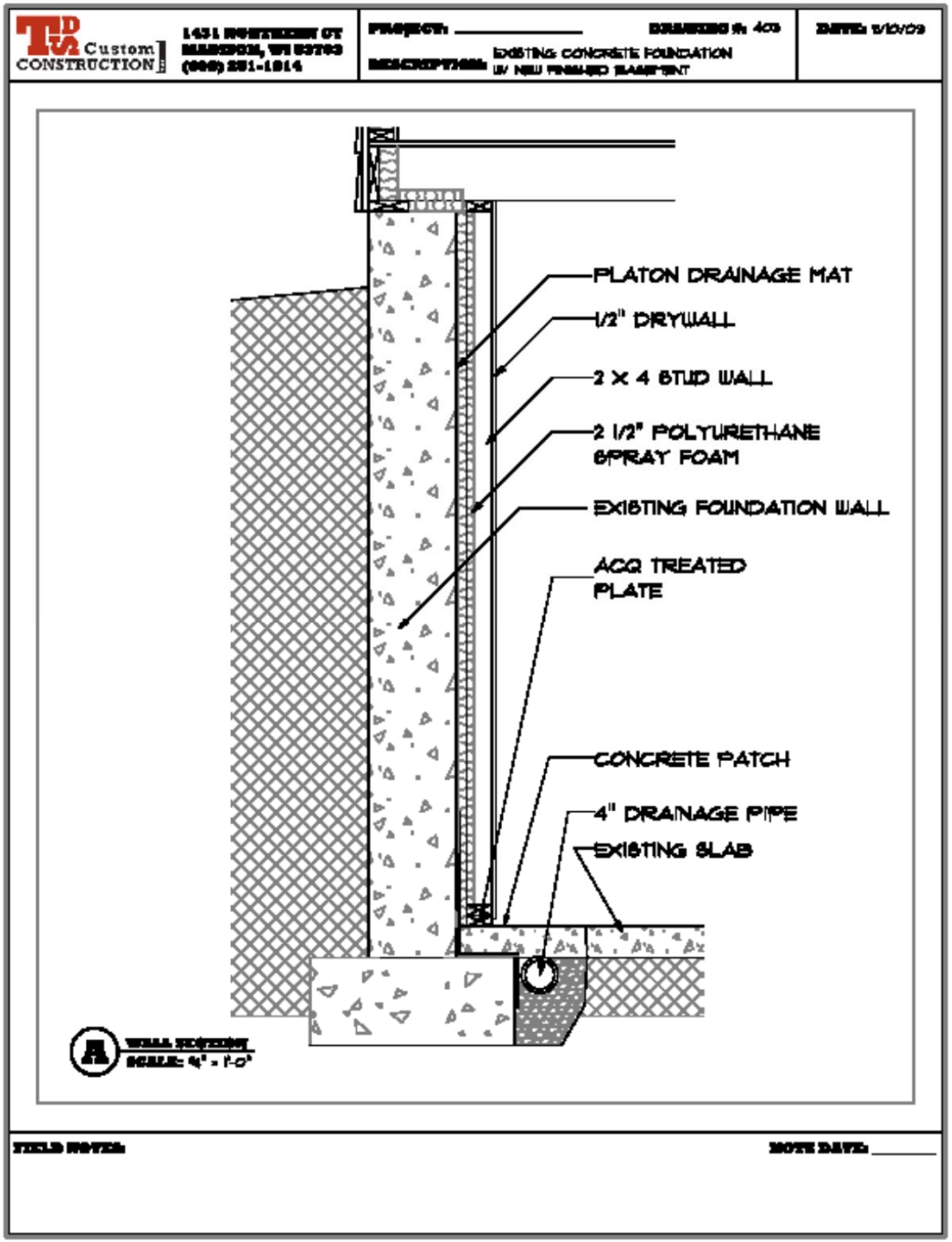
- No Finishes or drain tile included
- 3” Two-Part Spray foam over rubble
- “Thermo-Con” as fire retardant sprayed over urethane foam

Case #4

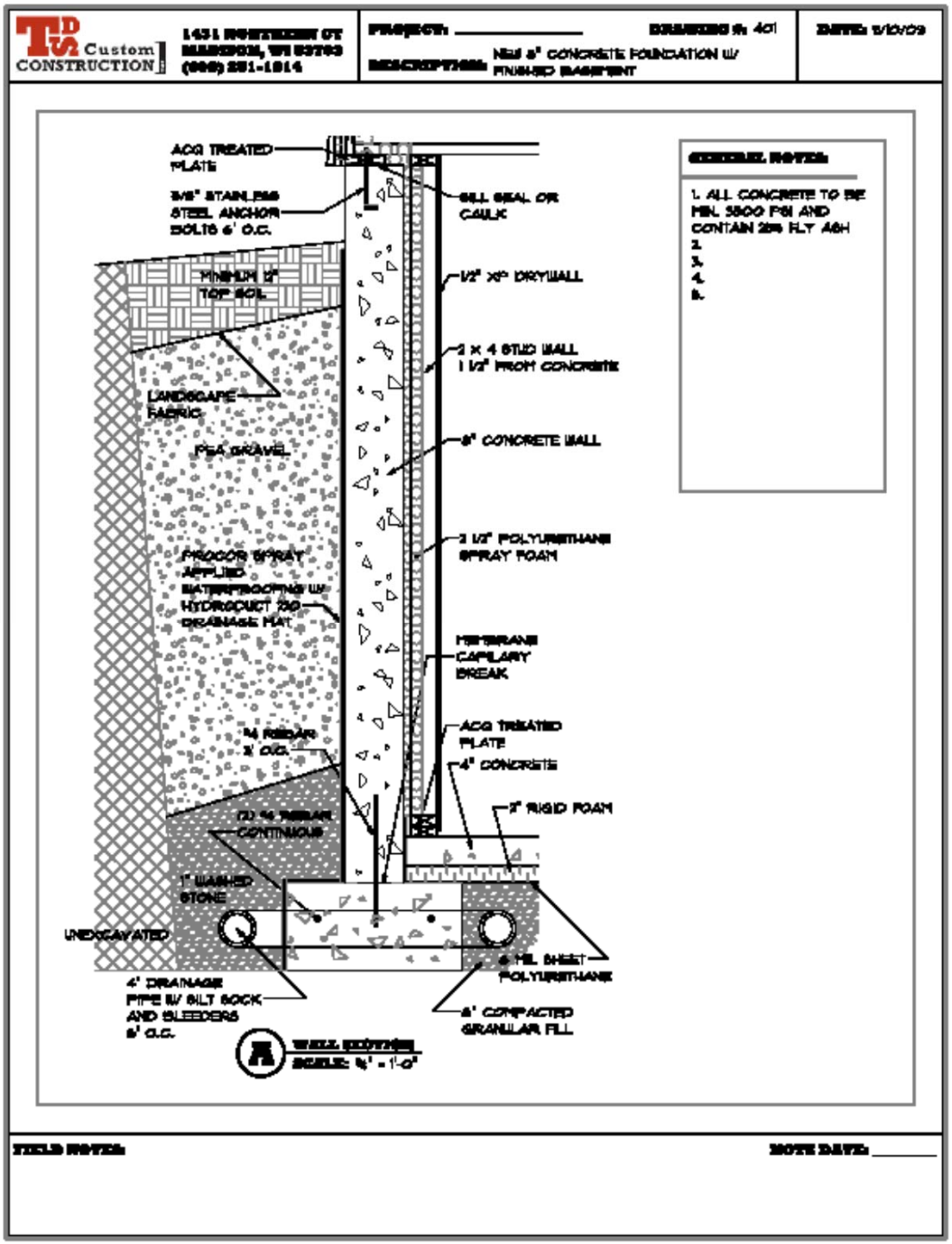
- Rubble Foundation
- Opened 7 years later

CASE #4

- Moist calcium pocket discovered at rubble face (size of dime)
- Wall was quite cold 3” above floor / floor itself was noticeably warmer



Wall Detail For Existing Foundation



Wall Detail For New Foundation