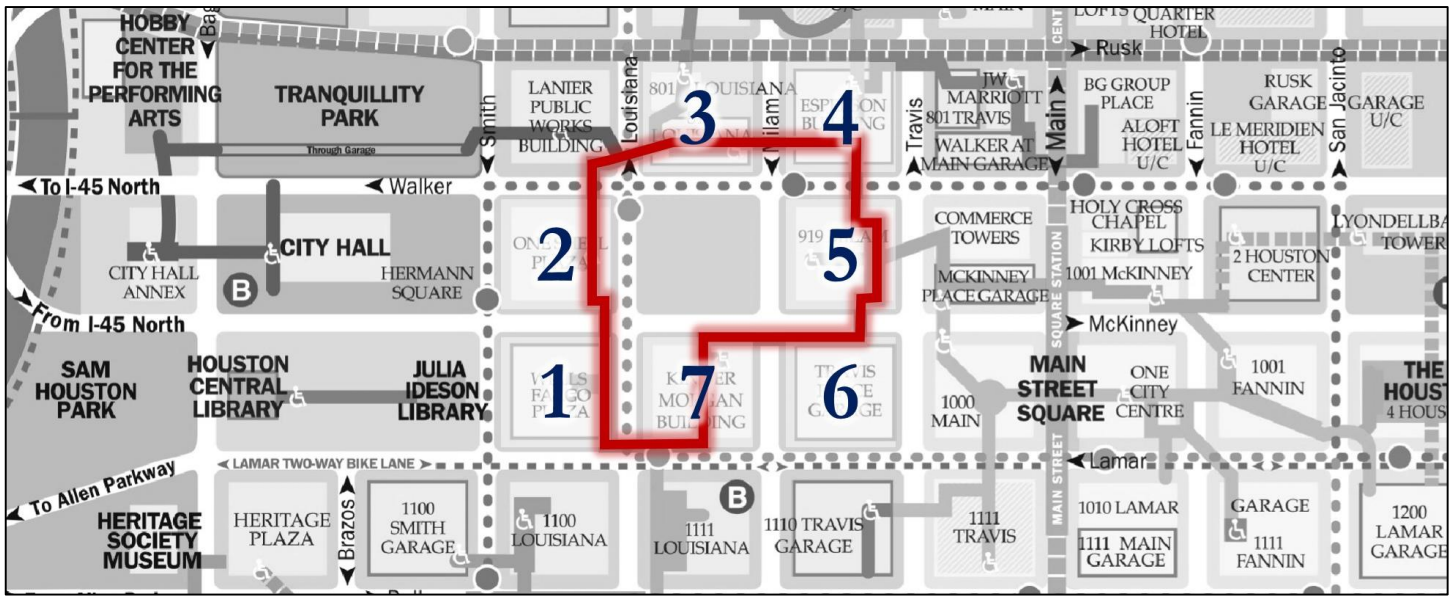
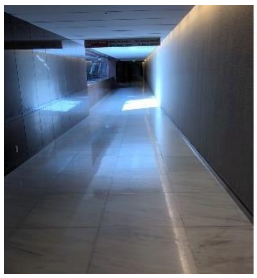
Tunnel Geology: A Self-Guided Walking Tour of Downtown Houston's Buildings (2018)

RED LOOP – 1/4 MILE (~20 MIN)



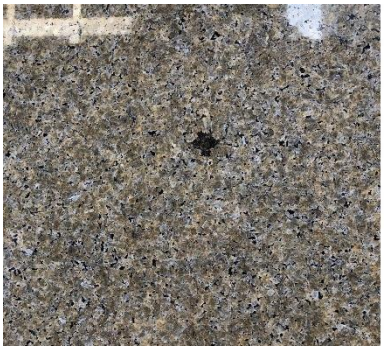
WELLS FARGO – 1000 LOUISIANA

Ign Met 1



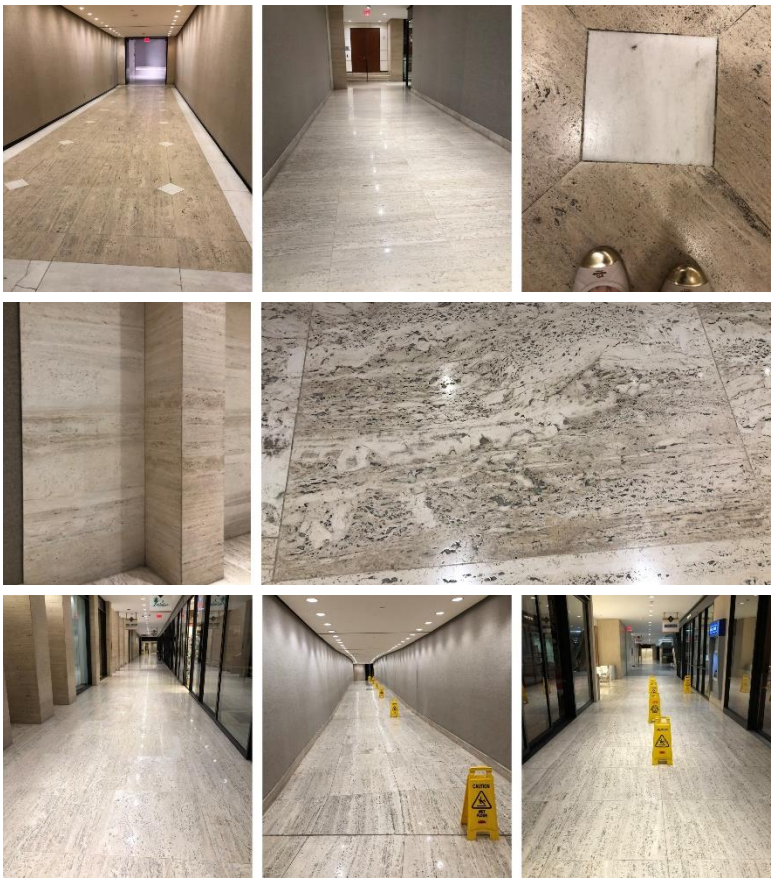







Flooring
Marble (white with grey veins, metamorphic)
Walls/Patio
Granite (red/pink, felsic igneous)
Poikilitic texture in the tunnel interior, granite with pegmatite veins on the patio pavement
Marble flooring inside, great views of granite accent stone at street level from patio.
Water Wall
Anorthosite (grey/tan, intermediate igneous)
Contains dark minerals and some labradorite
Accent Column
Larvikite (intermediate igneous)
Specific variety of Monzonite, for thumbnail-sized feldspar
Water Wall/Patio Flooring
Veined granite is cut in deceptively large blocks, with smaller blocks carved only on the surface in place. Dark mineral veins dominant.
Pegmatite veins: holocrystalline (roughly), intrusive igneous rock composed of interlocking phaneritic crystals (usually larger than 1")
Observed: potassium feldspar rich veins and dark mineral veins, contains both pyroxene and hornblende
Anorthosite: an intrusive igneous rock characterized by its composition: mostly plagioclase feldspar (90–100%), visible to the naked eye (large in this case) with a minimal mafic (pyroxene, ilmenite, magnetite, and olivine) component (0–10%)

ONE SHELL PLAZA – 910 LOUISIANA



Flooring/Walls
Tufa (Travertine, continental sedimentary)
Travertino Romano (trade) from Tivoli near Rome in Italy
Also known as Romano Classico or Travertine Classico and Travertino Romano Antico (darker varieties)
Walls and flooring all travertine

Accent Tiles
Marble (white with grey veins, metamorphic)
Tufa/Travertine: formed by algae/calcium carbonate in hot springs, phytoherms (freshwater reefs) and thrombolite-stromatolites; not to be confused with tuff/tufo (igneous)
Observed: stromatolite patterns/precipitation growth dominant feature, some vugs partially to fully filled with more transparent cement
Note: the tunnel between One Shell and Two Shell (next) was built diagonally to the streets above and connects to a short tunnel to the Lanier Public Works Building. Travertine remains through this section.

TWO SHELL PLAZA – 811 LOUISIANA

Flooring/Walls
Tufa (Travertine, continental sedimentary)
Identical to One Shell (see One Shell for details)

Accent Flooring (below lobby)
New (<5yrs)
Marble (dark metamorphic, likely low-grade metamorphism)
"Dirty" marble with fractures, flow features, and calcite veins
Dirty marble: contains impurities such as clay minerals, iron oxides, or bituminous material resulting in a bluish, gray, pink, yellow, or black color

ESPERSON BUILDINGS – 808 TRAVIS

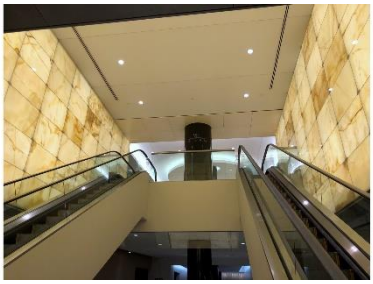





Met 4

Baseboards/Wall Accents
Marble (salmon and green-brown, metamorphic)
Multicolored/dirty marble on wall accents and brecciated marble on baseboards
Brecciated marble: broken fragments rolled and rounded by the flow of marble under pressure

919 MILAM

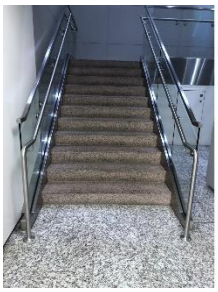

Sed 5

Escalator Walls
Onyx (tan, sedimentary)
Renovated/added in 2006, the escalator entrance at lobby level is now back-lit onyx, a banded variety of the oxide mineral chalcedony
Fun Fact
The first of three buildings in Downtown Houston to be networked in the first phase of a pedestrian tunnel system
Onyx: layered chalcedony that differs from agate only in the form of the bands: agate has curved bands and onyx has parallel bands

TRAVIS PLACE – 1010 TRAVIS


Ign 6

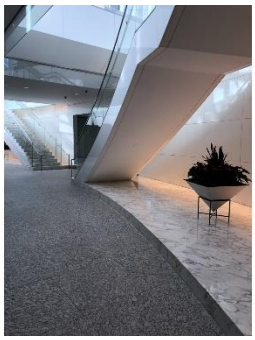
Flooring (light grey)
Granite (light grey felsic-intermediate intrusive igneous)
Color matched: Coldspring Rockville (trade)
From East-Central Batholith in Rockville, Minnesota (assumed)
PreCambrian (1.78gy)
Coldspring Rockville Granite: granite (quartz 20-60% and plagioclase 10-65%) to granodiorite (quartz 20-60% and plagioclase 65-90%)
Poikilitic texture: large component crystals contain smaller crystals of other minerals within them
Observed: large feldspars with poikilitic texture containing dense, dark minerals in almost every slab



Flooring Accent (dark grey)
Granite (dark grey felsic-intermediate intrusive igneous)
Color matched: Coldspring Lake Superior Green (trade)
From East-Central Batholith near Isabella, Minnesota (assumed)
Late Archean (2.8-2.5gy)
Coldspring Lake Superior Green: could be granite, granophyre, ferro-monzodiorite, or leucogabbro…
Observed: uniform and equal amounts of salt and pepper

Stairs/Accent
Granite (felsic intrusive igneous)
Color/texture match to Sunset Red Granite from Llano uplift in Texas
Phaneritic/ poikilitic pink granite with large rapakivi feldspars and dark mineral clusters
Poikilitic texture: large component crystals contain smaller crystals of other minerals within them, most easily observed in petrographic thin sections
Rapakivi: large rounded crystals of orthoclase that are surrounded by a rim of oligoclase (a variety of plagioclase)

KINDER MORGAN – 1001 LOUISIANA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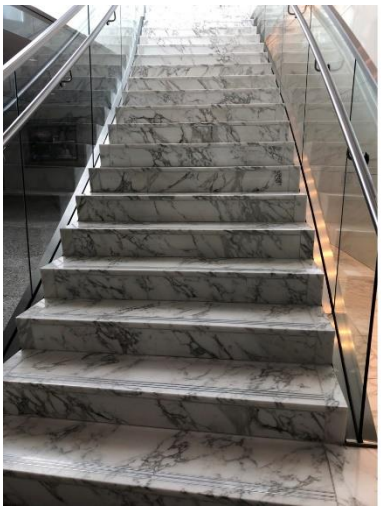

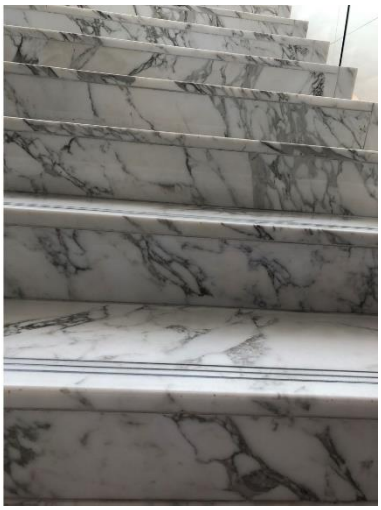

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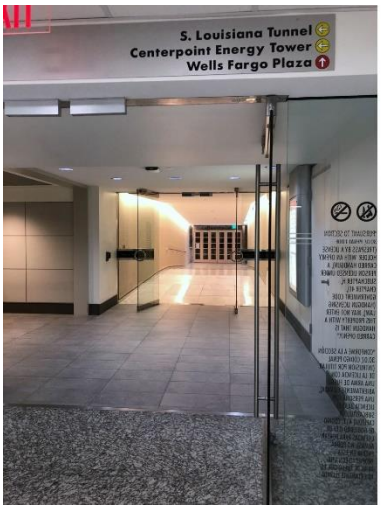
Stairs

Marble (white with grey veins, metamorphic)
Marble veins: due to various mineral impurities such as clay, silt, sand



…and back to Wells Fargo! Note: at the entrance of Wells Fargo from Kinder Morgan are four marble tiles that have been replaced with new marble tiles that have parallel veins compared to the original, which is more swirled.

BEFORE YOU GO

- **Safety**
  - Look up, not at your phone, when navigating downtown
  - Please be mindful of the traffic lights, pedestrian signals, bike lanes, and buses
  - Buses make frequent stops and can sometimes hop curbs
  - Some curbs, pavements, and streets may be uneven
- **Etiquette**
  - Please review the walking guide prior to arriving downtown to maximize time spent on the tour
  - Please be mindful of downtown employees and keep slower pedestrian traffic to the right so they can go about their business
  - Try to walk in pairs if walking around downtown as a group
  - If approached by a homeless person, try to be firm but respectful

REFERENCES

- Houston Geological Society, 1995, Walking Tour of Downtown Houston Building Stones: Research Committee, Philip W. Porter
- Houston Gem and Mineral Society, Houston Geologic Society, 2008, Walking Tour – Houston Building Stones, Neal Immega
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CONTRIBUTORS

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