TECHNICAL SITE VISIT

ST. JOSEPH'S MISSION CHURCH
MESCALERO , NEW MEXICO

SUBMITTED BY

DALE F. ZINN
ARCHITECT

Contact : Brother Peter
St. Joseph Mission Church
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NAME OF THE CHURCH: ST. JOSEPH'S MISSION
MESCALERO, NEW MEXICO

WEATHER: PARTLY CLOUDY TEMP MID 60'S WINDY

VOLUNTEERS: NONE

REPRESENTATIVE OF OWNER: BROTHER PETER

PRELIMINARY INFORMATION:

The visit to St. Joseph's Church was prompted by calls made to Cornerstones Foundation from the Archdiocese representative for the Archbishop's Commission of the Preservation of historic Churches.

The Church was the subject of a report entitled "St. Joseph's Church Inspection" published by the New Mexico State University Engineering Department ASCE Student Chapter, under the direction of Dr. Ronald B. McPherson. The students made a site visit and developed an overall building condition assessment report in February 1994. Some drawings and details were presented as part of the report.

The major findings of the 1994 student report were as follows:

1. Roofing tiles broken or missing

2. Roof gutter system should be modified to direct water away.

3. Deteriorated mortar

4. Stones should be sealed.

In addition the building was carefully surveyed and found to be relatively free of settlement problems.

PURPOSE: The purpose of my visit to the site was to assess the roof problems and related water issues and make recommendations for repairs.

FOUNDATION: The stone foundation is in good condition as attested to by the student survey. The building is on top of a small hill .The drainage away from the building is generally good. Site drainage and removal of plant materials growing adjacent to the building should be accomplished each year. It was noted that the lower portions of the roof drain into gutters which are carried into an underground system. Since the structure is on a hill the underground system may be sufficient in carrying water into french drains that drain away. However there is a questions of the exact nature of the termination points for these roof drains.

Recommendation: Provide an annual maintenance item to add compacted fill to the base of the structure where erosion is taking place. Direct all water way from the building on all sides. Determine the exact termination point for all roof drains that go underground. Extend these lines to flow to daylight to ensure that the building foundations are not receiving water from the roof. Inspect and test these drains on an annual basis to assure drainage is freely flowing.

WINDOWS AND DOORS: The windows and doors are generally are in fair to good condition. there are some areas over the tiled roofs where access to the windows is limited. The wood louvered panels over the bell tower fenestration is weather and in need of protective coatings.

Access to these areas is limited to inside faces, with access via the bell tower.

Recommendation: The primary need is to concentrate on other aspects of the church. The maintenance schedule for accessible windows and doors would be to renew protective coatings and sealants every three years. The caulking around the perimeter of the windows and doors on both the inside and outside should be caulked with an appropriate colored material every 5 years, or when gaps are noticed. Sill's and bottom section of window frames may need treatment every year. Bell tower louvers need to be stripped and repainted inside and out.

FLOORS: the floors are currently covered with quarry tile installed in the 1960's. This is a suitable flooring over the radiant heating system.

Recommendation :Care should taken not to heat up cold tile floors too rapidly. Excess water in the process of cleaning should be avoided.

Inspect floor mortar joints for excessive cracking and seal to avoid water entry.

Immediately shut off supply water and drain boilers if evidence of broken radiant piping under tile floor is discovered or suspected.

ROOF:The clay tile roofing was removed and reinstalled in the 1960's . Some of the tile was replaced at that time, and some of the replacement tiles furnished remain on site for future repairs.

It is evident that the project in the 1960's was accomplished in a manner that used first class materials and workmanship. Copper and brass braided wires were strung in each line of tiles and each tile is tied off to the braided wires individually. The problems with the roofing today are caused by missing tiles or wind deflected tiles that allow water to enter under the roof and find paths to areas under the flashing and adjacent to the stone walls.

Roof drainage patterns were altered slightly at some time in the past. Where the main roof and cross aisle gable roofs intersect there are areas that were intended originally to drain the lower portions of these roofs directly through the wall. (see sketches) The drainage has been altered to eliminate a drain pipe and the roof water is directed to a point around the parapet walls to another point where the water is allowed to run out through a copper or brass tube in the wall. The tube is integral to the metal flashing on the inside face of the parapet. The tubing was subsequently been cut off inside of the stone wall where it now passes through and is loosely fitted to a clay sewer pipe that extend out of the wall. Water generally exits the clay pipe and spills over the stone faces of the church and eventually to the ground.

Several points of access for water to the interior of the building and to the stone walls were identified to the Brother Peter while we were on the roof. Tile roofs, in general lack inspection points to see where water is entering. A maintenance plan that fixes and replaces all visible problems and continues to monitor leaks is the most effective way of monitoring water problems. At some time in the future the roof will need to be replaced entirely in order to inspect and repair all water proofing sheets and flashing. If the roofing is placed into a proper state of repair and the flashing are inspected annually the roof should last another 10 to 20 years.

Recommendations:

1. Access to the roof should be limited. the roof tiles are fragile and should not be walked on at all. Devises to spread the load of a person on the roof can be hand built to protect the tiles during inspections and repairs. Suggestions include a 3/4" carpet covered plywood platform with sand bags affixed to the bottom match the tile concave troughs.This platform could be useful,in working for long periods of time on the roof field tiles. Handling the platform would require a rope tie off system with possible counterweights to the opposite side of the church.

Just sand bags could be used for limited access,to small areas of the roof.

2. Inspect the areas where water can currently pond on the roof, in troughs. These areas may be holding large amounts of water that is not leaving the building quickly enough through the drain pipe system. Use 50 year silicone to seal any identified holes , gaps in soldered seams or transitions to roof drains.

3. Replace drain pipes through stone walls so that the intersection of the roof and the pipe can be inspected. At this time the intersection is within the wall. The appropriate materials would be a copper or brass tubing material that is flanged to overlay the flashing on the inside of the parapet wall. (See Sketch) The flange can be soldered, anchored and sealed over the existing metal flashing where it can be annually inspected, and repaired if necessary. The tubing should extend out of the stone walls 24 " and possibly offset to avoid direct spillage onto buttresses and roof tiles below. (See Sketch).

To accomplish this project with alternative materials like PVC may be a possibility however, the attachment to the existing flashing and anchorage would need to be studied carefully.

4. Using appropriate methods to access the roof as described above, the roofing tiles need to be repaired and replaced where missing.
Roofing tiles may need to be removed and replaced in small areas from bottom up to properly anchor all of the tiles in one string. Brass, Stainless steel or copper heavy gage wire needs to be used to tie tiles to the braided "stringer" that holds the tiles in place. This braided stringer should be inspected especially where it penetrates the bottom flashing . There could be an access point for water at that anchorage point.

There are caulking and sealing materials available for sealing the down slope edges of roof tiles that are effective in keeping the wind form displacing the tiles. This will also prevent wind from blowing water back under the tile. A leaking condition may be occurring where there is a penetration of the cross bracing through the top ridge course of tile, and along the entire ridge where several repairs have been made and the tile "fit" is uneven in places. the recommendation would be to seal all of the roof ridge tile overlap joints, and to at least place a dab of sealant to anchor tiles to each other in the field.

STONE WALLS AND PARAPETS: The stone walls are locally quarried limestone and have places where the mortar has been inappropriately repaired on the interior. Mortar should match the historic mortar in color and texture. It is important that the mortar be higher in lime content to assure that it is softer than the stone materials.

The stone has discolored and taken on dark staining due to roof run off directed down the face of the building in places. This condition can be ultimately cleaned, with gentle water blasting. This is not priority undertaking at this time.

Stones have fallen on the interior and some small stones on the exterior due to roof leaks and probable freeze thaw conditions taking place in the stone walls that reduced the mortar to sand and loosens stones.

Recommendations: Once the roof leaks and water is directed away from the face of the building to the best extent possible; the stone work needs to be re-pointed and ultimately cleaned.

Access to the interior and exterior wall faces is limited at this time due to lack of scaffolding and other methods of reaching the entire building faces. Once access is gained a biannual inspection should include inspections for loose stones and develop and method for re-pointing and affixing stones that have become loose.

The stone parapets are stepped and capped at each step with concrete. In the past some of these concrete caps have been replaced on the south side of the church. There are paths for water entre between the joints and through the porous concrete caps.

The concrete caps should be inspected and all exposed horizontal joints should be sealed with long life silicone. Remove the existing joint sealing materials where they have failed. Other joints that should be inspected include the underside joint between the concrete cap and the stone where water run off could be entering the top of the stone walls. This joint could also be sealed with silicone.

It is important that the joint sealant not be used where it is visible from the casual observer at ground level; unless the sealant matches the stone or mortar color and is relatively unnoticeable.

An application of El Rey 3000 adobe protector to the tops and inside faces of the parapets will help to keep water form penetration into the surfaces where it is porous.

CONTRARY TO THE RECOMMENDATION OF THE NEW MEXICO STATE REPORT ; It is not recommended that the stone faces of the church be sealed at this time. Further study of the effects of sealing stone and assurances that moisture is not trapped behind the stone faces, need to be made before this recommendation can be considered. the stone should also be cleaned before it is treated. The product proposed is not a sealer in that it covers the stone with a protective layer. The product contains only 3% solids and is designed to set up electrostatic layers that repulse other water ions. This reaction keeps water from easily penetrating the surface, while letting the interior of the wall breathe.

The application of sealers and even El Rey 3000 may darken or stain the stone in some way. Experiments should be accomplished to determine the effects of treatments over a wide range of conditions before recommending any outside stone treatments.

OTHER BUILDING COMPONENTS: The access to the roof is made via a ladder to the bell tower above the small chapel and then proceeding up a wooden stair without rails to the bell tower floor approximately equal to the lowest point of the pitched high roof. The stair/ladder seems to be structurally intact, however the element sways with weight on it.

Recommendation: Anchor the outside stringer to the inside face of the stone walls, using masonry anchors into mortar joints if deemed sound enough; or into the stone. Anchors should be placed at 4 to 6 feet apart along the entire length of the stair and landings.

Inspect the stair and the exposed structure of the tower for deterioration annually, with appropriate lighting and access to all areas of the exposed structure to assess deterioration.

The bell tower floor is covered with Bat Guano. the bell tower louvers are very open and any number of birds insects and bats have free access to the bell tower for protection form the weather.

Recommendation: The access of birds and bats into the bell tower should be limited through some inside screening of the louvers.

In general varmints and birds can carry insects that can possibly infest the structural elements. The bat guano is actually providing a "roofing" for the bell tower floor because wind driven water. A health problem may exist due to the collection of droppings in this space, and there is a possibility the additional weight of the droppings may eventually become a structural problem.

Recommendation: Remove the droppings from the bell tower floor. Provide dry sheet of 2 30# roofing felts nailed to existing decking and apply third layer of #90 pound mineral surface roofing finish sheet, also nailed in place.

BUILDING SYSTEMS: Electrical Plumbing and Heating systems were not inspected.Providing additional electrical outlets and lighting in the bell tower may be helpful in accomplishing inspections and repairs in the bell tower, and on the roof.

SUMMARY: The building is impressive as an architectural work and continues to be in relatively good condition due to the original care in the construction. Subsequent repairs have been accomplished to the best extent that resources would allow. No permanent damage has been caused by the intrusion of water from roof leaks and improper drainage; however these conditions need to be repaired and monitored on a regular basis to assure the structural integrity of the building structural components. Access to the various parts of the building is a problem that needs to be addressed in order to make necessary repairs, inspections of all building components.

Recommendations:

1. Provide a resource or purchase adequate scaffolding that would allow access to all parts of the building. Three sections wide extending at least 30 feet high would be useful, for interior and exterior applications. Each section is typically 5 feet high, although 6 foot section are available.

   Metal decking for the scaffolding should be acquired to provide a full platform across the three sections. Wood decking is acceptable but must be carefully used and not overloaded.

2. Provide resource or purchase materials for making appropriate inspection and repair platform for roof tiles. Consult with Las Cruces and El Paseo roofing contractors for possibilities and methodologies,including safety issues..

3. Provide resource or purchase materials to seal gaps in tile and stone. Estimated 100 tubes of silicone 50 year high quality materials and several caulking guns. Note: The work should be done carefully and without too many people on the roof at one time. all safety precautions need to be made before attempting this work.

4. Verify the number of roof tiles that might be needed and locate resource for used or new tiles that exactly match the configuration of the existing tiles. Estimated 50- 100 tiles should be stockpiled. Identify source for copper or brass tubing and resource for people skilled in working with these materials.

5. Make repairs and replacements as described above.

6. Develop a long term maintenance plan and begin to chart the work that is done to the church for an archival record. Noting resources, brand names and formulas for mortar mixes etc.

SUBMITTED BY DALE F. ZINN ARCHITECT
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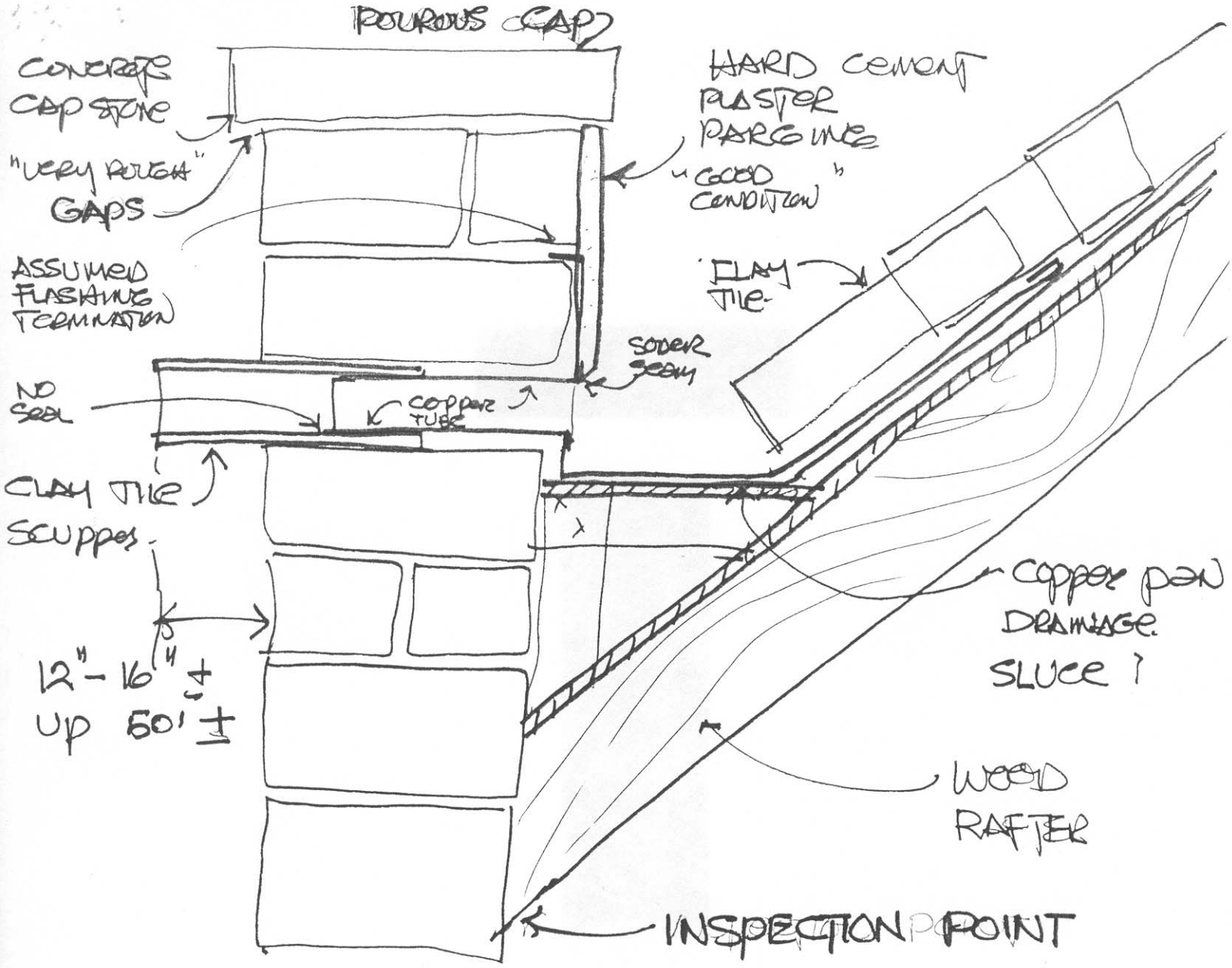
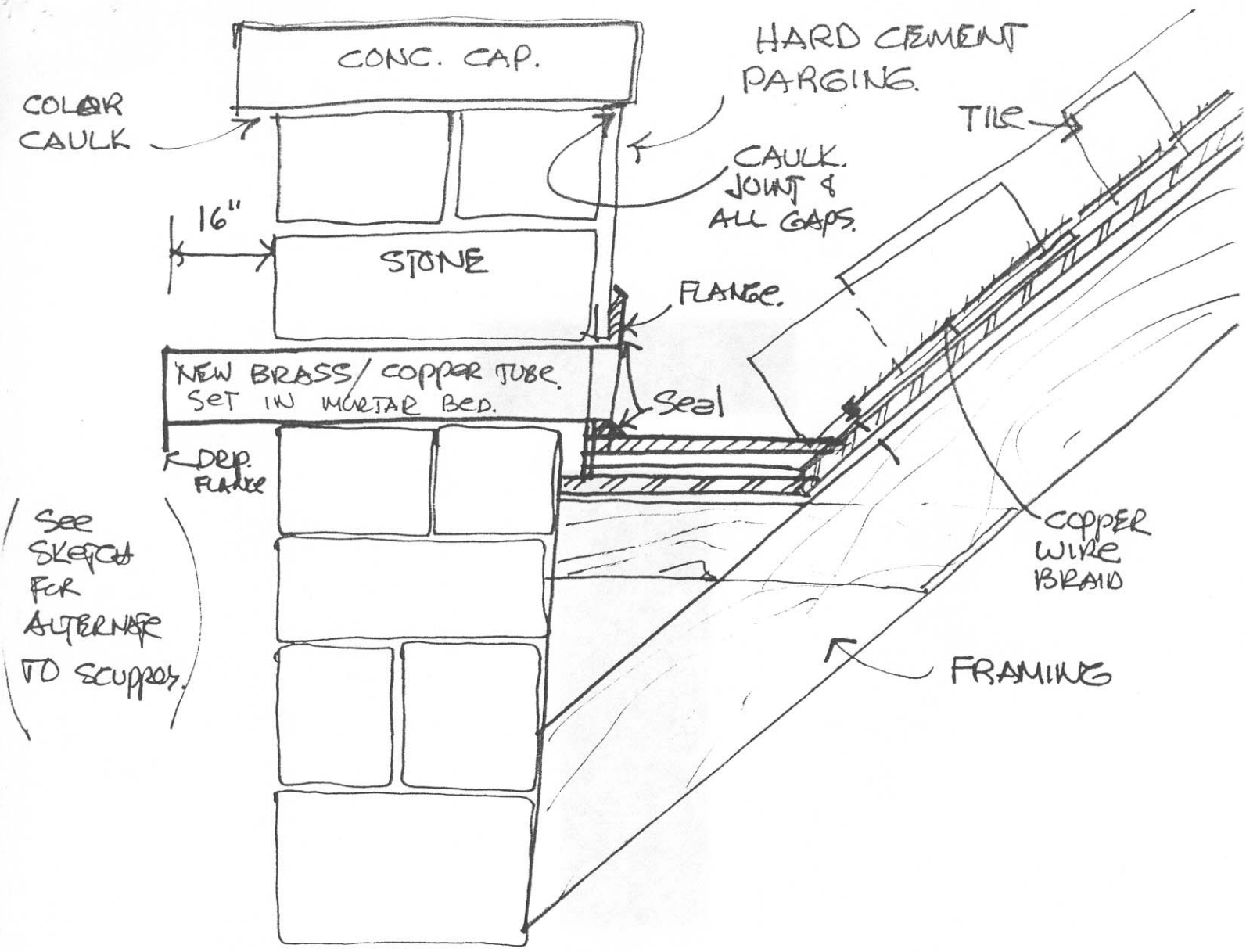


SECTION OF SCUPPER THRU WALL @ SE/SW CORNER. — EXISTING CONDITION

ST. JOSEPH'S CHURCH



SECTION OF TYPICAL SCUPPER REPLACEMENT THROUGH WALL

NOT TO SCALE

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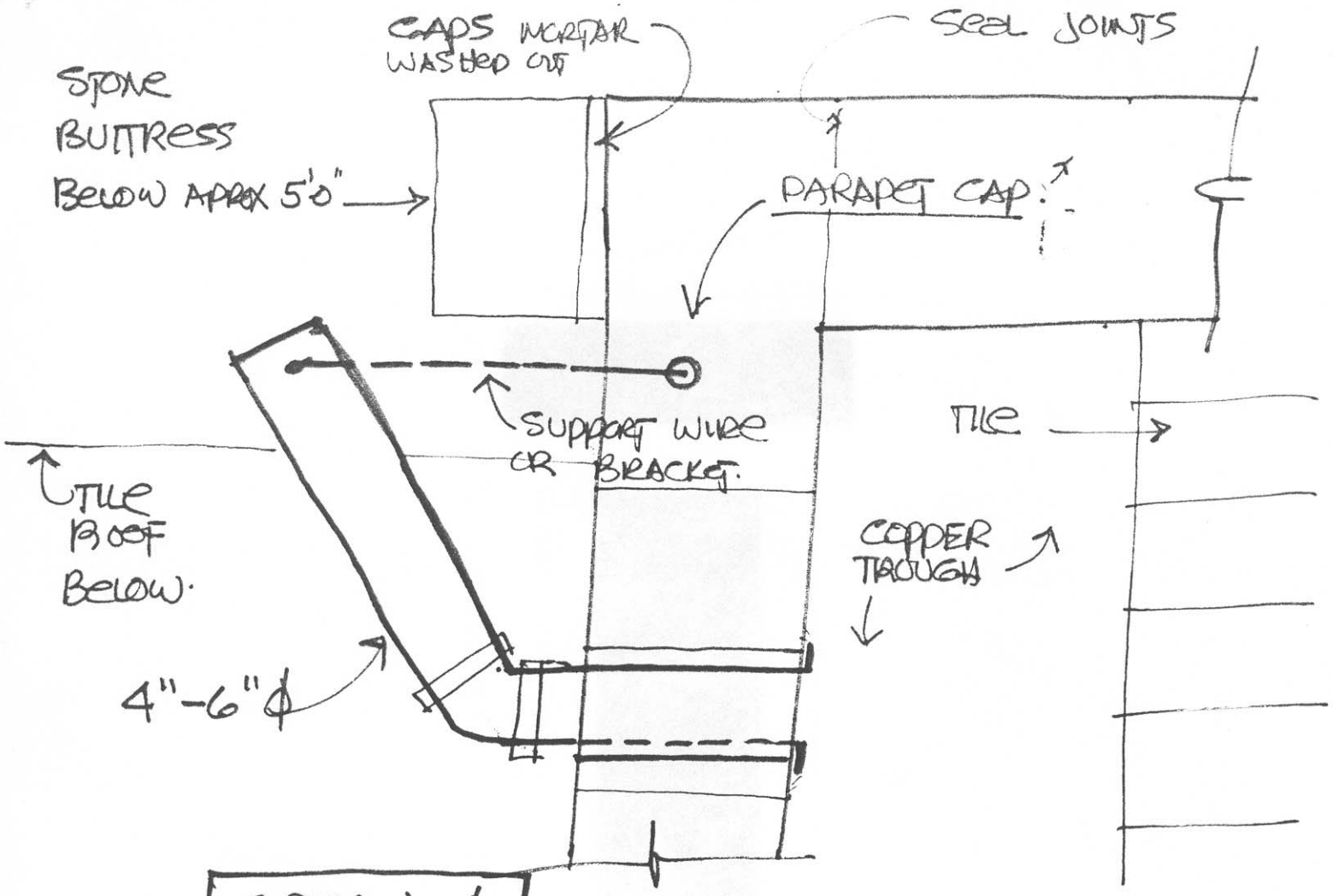

OPTION A

PLAN DETAIL @ NEW SCUPPER

NO SCALE

EXTEND SCUPPER @ OFFSET 45° ± TO ALLOW WATER SPILLAGE TO CLEAR THE TILE ROOF BELOW.

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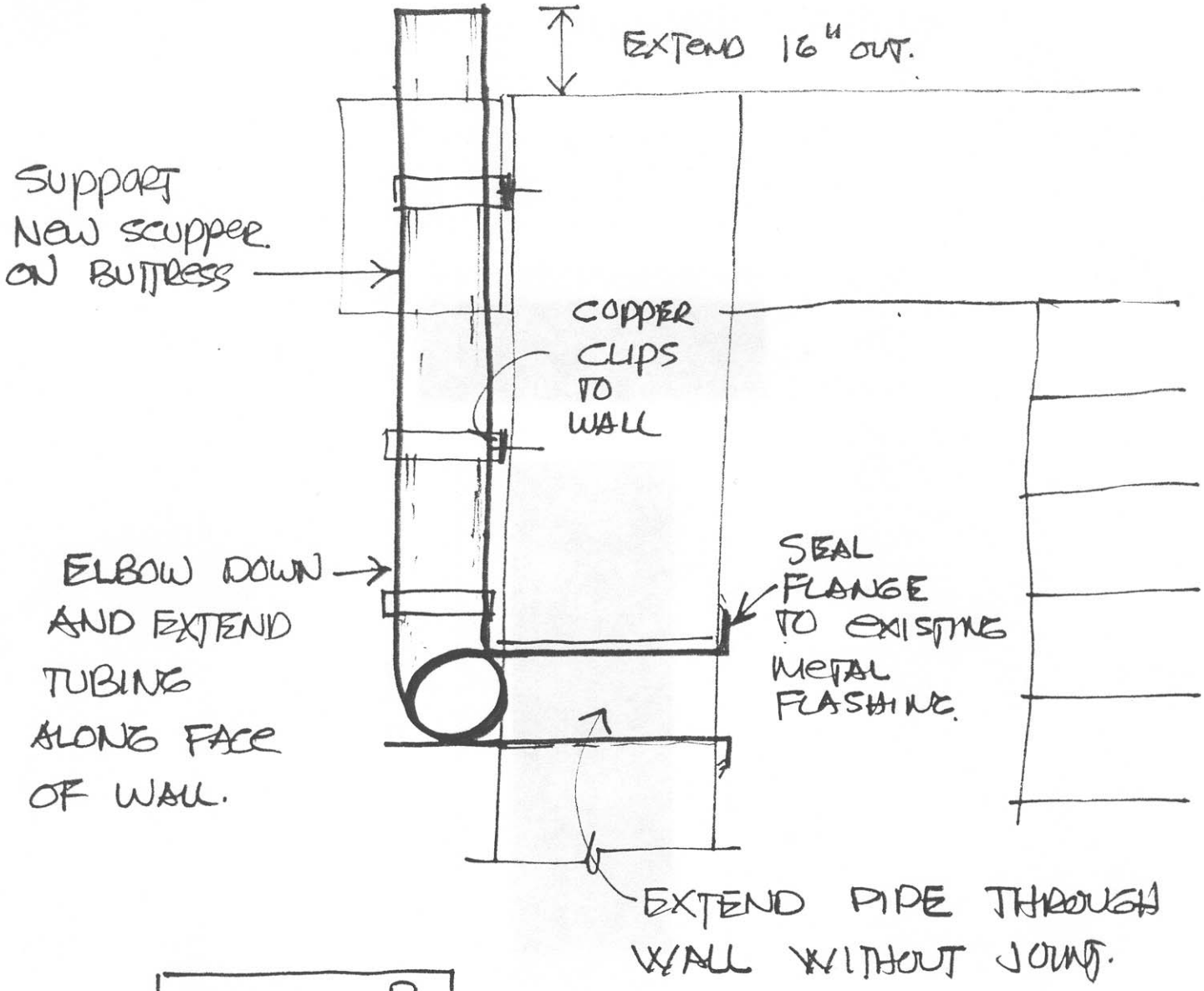

OPTION B

PLAN DETAIL @ NEW SCUPPER

EXTEND TUBE THROUGH WALL AND DOWN TO FULLY REST ON BUTTRESS BELOW.

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