Second Level Pottery Analysis of Motul de San Jose

Part 3: Operations with Comparisons by Antonia E. Foias

Evalynn Rosado
2009
Operation 2

Core, Group C

There are 1239 total pieces in Operation 2.

General Form Class: Of the closed vessels there were 21 (1.7%) drums, 15 (1.2%) jars and 26 (2.1%) that were indeterminate. Of the open forms there 576 (46%) were indeterminate, 164 (13%) tripod plates, 56 (4.5%) cylinder vases, 108 (9%) dishes or bowls with rounded sides and 233 (19%) dishes or bowls with flared or outcurved sides.

Lip: 424 (34%) had rounded lips, 180 (14%) had beveled lips, 94 (7.6%) had pointed lips, 61 (4.9%) had square or flattened lips and 1 had a grooved lip. 15 were present but indeterminate and 464 were not present.

Rim: 637 (51%) had direct rims, 104 (8.4%) had rims that were between slightly flaring and flaring, 3 had everted rims, 1 had an exteriorly folded rim, and 1 had a slightly flaring and exteriorly thickened rim. There were 464 with the rim absent.

Wall Type: 341 (27%) were outflared and 3 were very outflared. 99 (7.9%) were slightly outcurved and 23 (1.8%) were outcurved to very outcurved, totally 10% of all pieces. 90 (7.2%) were open and rounded and 22 (1.7%) were incurved and rounded, totaling 9%. There were 66 (5.3%) with vertical walls and 7 (0.1%) with recurved walls. 112 were indeterminate.

Special Body Sherd: there were 39 (3.1%) with ridges, 2 (<0.1%) with notched ridges and 12 (0.1%) with otherwise modified ridges. 6 (<0.1%) contained angles and 24 (1.9%) had necks.

Base: 427 (34%) had open flat bases, 76 (6.1%) had open and flat bases but also had tripod feet, 9 (0.1%) had open and rounded bases with tripod feet, 33 (2.6%) were open and convex, 3 (<0.1%) were open with a ring and 4 (<0.1%) were closed direct. 89 were indeterminate.

Foot Forms: 26 (2.1%) had flat-bottomed, hollow oven style feet, 5 (<0.1%) had round-bottomed, hollow oven style feet, there was also one that was hollow and in the oven style but no longer had the bottom of the feet. There were 11 (0.09%) that had IK style feet. There was 1 with solid slab feet. There was also 53 feet that were indeterminate.

Rim Diameter: There was a mean rim diameter of 20.0cm with a standard deviation of 7.1 cm.
Wall Thickness: The mean wall thickness was 0.734 cm with a standard deviation of 0.165 cm.

Vessel Height: The mean vessel height was 5.8 cm with a standard deviation of 2.8 cm. There were larger values that I believed skewed the mean and standard deviation: 10.4, 10.9, 11.8, 17.9, 20.4, 21, and 21.2.
Feet Height: There was a mean of 4.00 cm and a standard deviation of 2.06 cm but there were only 32 instances of feet height so further analysis is difficult.

Paste Color:
- There were 8 pieces in hue 2.5Y. One was dark gray, one was light olive brown, one was light brownish gray and 5 were pale yellow.
- There were 8 pieces in 2.5YR. 3 were red, 1 was pink, 2 were light reddish brown, 1 was weak red and 1 was between weak red and reddish brown.
  - 3 were within category A.
- There were 123 (1.0%) pieces in 5YR. 83 were yellowish red, 35 were reddish yellow, 2 were light reddish brown, 2 were reddish brown and 1 was dark gray.
  - 35 were in category B
- There were 629 (50.7%) pieces in 7.5YR, the most common group. 310 were reddish yellow, 246 were strong brown, 27 were brown, 14 were between dark brown and brown, 1 brown, 1 black, 10 light brown, 1 gray and 19 were pink.
  - 61 were in category C
There were 464 (37.4%) pieces in 10 YR. 140 were brownish yellow, 65 were light yellowish brown, 72 were yellow, 86 were very pale brown, 52 were yellowish brown, 9 dark yellowish brown, 8 were brown, 11 were between brown and dark brown, 2 were dark brown, 5 were very dark grayish brown, 3 were very dark gray, 1 was black, 1 gray, 3 light gray, 1 light brownish gray, 2 were dark grayish brown and 3 were grayish brown.

- 158 were in category E.

Paste Type:

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Inclusions: 507 (40.9%) had ferruginous as inclusions, 194 (15.6%) had Carbon, 91 (7.3%) had ferruginous and carbon, 18 (1.4%) had mica, 1 had Concha, and 2 had volcanic ash.

Presence of a Core: 336 (22.1%) had a wide core, 187 (15.1%) had a narrow core, half of the exterior was dark on 53 (4.2%) and half the interior was dark on 34 (2.7%) pieces.

Fireclouds: 150 (18.4%) had fireclouds present. 184 were indeterminate.

Underslip Color: 756 (61%) had a white or cream underslip, 156 (12%) had orange underslip, 157 (12%) were indeterminate, and 170 did not have an underslip.

Background Slip: 661 (53%) had orange background slips, 259 (21%) had red background slips, 203 (16%) had cream background slips and 82 were indeterminate.
Additional Slips: 401 (32%) had additional red and black slips, 182 (15%) had black slips, 175 (14%) had additional red slips, 60 (4.8%) had slips that were red, black and other colors, 57 (4.6%) had slips that were red black and orange, 17 (1.3%) had orange and black slips, 11 had orange and red slips, 7 had orange slips, and 10 had other colors as slips.

Designs Present: There were 220 (17.7%) with general geometric designs, 83 (6.7%) with simple geometric designs, 16 (1.6%) with complex geometric designs, 2 with a geometric design and figural animals, plants or insects, 5 with a geometric design along with figural humans, 25 (2.0%) with a geometric design and pseudoglyphs and 14 (1.1%) with a geometric design and glyphs. Of the figural designs there were 7 general designs, 4 with humans or deities, 3 with humans and pseudoglyphs, and 6 with humans and glyphs. Additionally, there were 8 with a general glyphic design, 5 with a general pseudoglyphic design and 78 with indeterminate designs.

Additional Decoration: 9 had negative or resist painting, 7 had incisions, 1 had fluting, 1 had modeling and 5 were indeterminate.

Location of Design: 350 (28%) had the design on the exterior and nothing on the interior, 85 (7%) had the design on the interior and nothing on the exterior, 25 (2.0%) had the main design on the interior and a secondary design on the exterior, 24 (2.0%) had the main design on the exterior and a secondary design on the interior, 32 (2.5%) had the main design on the interior but the exterior was too eroded to locate any other designs, 46 (3.7%) had the main design on the exterior but the interior was too eroded to locate any other designs. The location was indeterminate with 200 pieces.

Rim/Lip Slip: 394 (31%) were red, 124 (10%) were black, 50 (0.4%) were black on the lip and red on the rim, 23 (0.2%) were orange and 1 was black and orange. 647 (52%) were absent.
Operation 15

Core, Group D

There are 463 pieces in the database from operation 15. 324 are from Sub-Op A, 51 are from B, 4 are from D, 1 from E and 83 are from F. 64% were found in either level 2 or 3.

General Form Class: Of the closed vessels, 4 (0.9%) were indeterminate, 6 (1.3%) were drums and 8 (1.7%) were jars. There were 194 (41.9%) were open indeterminate, 69 (14.9%) tripod plates or dishes, 30 (6.5%) cylinder vases, 47 (10.2%) dishes or bowls with rounded sides, and 95 (20.5%) dishes or bowls with flared or outcurved sides.

Lip: 131 (28%) had rounded lips, 34 (7.3%) had square lips, 34 (7.3%) had pointed lips, and 51 (11.0%) had beveled lips. 206 were missing the lip.

Rim: 173 (37%) had direct rims, 62 (13.4%) were between slightly flaring to flaring, 1 (0.2%) was exteriorly thickened, 7 (1.5%) were interiorly thickened, 1 (0.2%) was exteriorly folded, 3 (0.6%) were slightly incurved and exteriorly thickened, 5 (1.1%) were slightly outflared and exteriorly thickened, and 5 (1.1%) were indeterminate.

Wall Type: 94 (20.3%) were outflared, 1 (0.2%) was very outflared, 45 (9.7%) were slightly outcurved, 36 (7.8%) were between outcurved and very outcurved, 39 (8.4%) were open and rounded, 15 (3.2%) were incurved and rounded, 38 (8.2%) were vertical, and 2 (0.4%) were recurved.

Special Body Sherd: 7 (1.5%) had ridges, 5 (1.1%) had notched ridges, 4 (0.9%) had necks and 1 (0.2%) was indeterminate.

Base: there were 115 (24.8%) open and flat, 37 (8.0%) were open and flat but with tripod feet, 4 (0.9%) were open and rounded with tripod feet, 10 (2.2%) were open and convex, and 2 (0.4%) were closed and direct.

Foot Forms: 8 (1.7%) had flat-bottomed hollow, oven feet, 4 (0.9%) were hollow oven feet but were missing the bottom, 1 (0.2%) was solid and conical, 1 (0.2%) was solid and slab, and one (0.2%) was hollow and conical. In addition, 25 were indeterminate.

Rim Diameter: The Mean rim diameter was 20.65cm with a standard deviation of 8.41cm.
Wall Thickness: The mean wall thickness was 0.73cm with a standard deviation of 0.15cm.
Vessel Height: There were only 29 instances that had values for vessel height. The Mean of these was 4.62 cm with a standard deviation of 1.32 cm.

Foot height: There were only three pieces of data. One each of 2.1 cm, 2.4 cm and 4 cm.

Paste Color:
- There were two in the Y category, both were in 2.5Y and were light olive green.
- There were 18 (3.8%) in 2.5 YR. There were 11 reds, 1 weak red, 3 light reddish brown, 1 light red, 1 dusky red and 1 between weak red and reddish brown.
  - 11 were in category A.
- There were 86 (18.6%) in 5 YR. 32 were reddish yellow, 49 were yellowish red, 2 were light reddish brown, 3 were reddish brown
  - 32 were in category B
- There were 224 (48.4%) in 7.5 YR, the most common group. 119 were reddish yellow, 67 were strong brown, 15 were brown, 3 were between brown and strong brown, 5 were between brown and dark brown, 8 were light brown, 1 was between light brown and reddish yellow, one was between light brown and pinkish gray, 1 was between pinkish gray and light gray, 3 were pink and 1 was between pink and reddish yellow.
  - 26 were in category C.
- There were 119 (25.7%) in 10 YR. 37 were brownish yellow, 24 were light yellowish brown, 10 were yellowish brown, 16 were yellow, 13 were very pale brown, 3 were between very pale brown and yellow, 1 was pale brown, 1 was light brownish gray, one was gray, one was grayish brown, 4 were brown, 3 were between brown and dark brown, 2 were dark yellowish brown, 1 was very dark grayish brown, 1 was very dark gray and one was very dark brown.
  - 42 were in category E.

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Inclusions: 217 (47%) had ferruginous as inclusions, 32 (6.9%) had carbon, 25 (5.4%) had carbon and ferruginous, 9 (1.9%) had mica, 1 (0.2%) had concha, 2 (0.4%) had volcanic ash, and 4 (0.9%) had volcanic ash and ferruginous.
Presence of a Core: 70 (15%) had a wide core, 59 (13%) had a narrow core, half of the interior was dark on 16 of them and half the exterior was dark on 8 of them. 310 (67%) had no core. In total 28% had cores.

Fireclouds: 68 had fireclouds (20.4%), 56 were indeterminate and 210 had no fireclouds.

Underslip Color: 221 (47%) had white or cream underslips, 37 (8.0%) had orange underslips, and 50 (10.8%) were indeterminate.

Background Slip Color: 234 (50%) had orange backgrounds, 109 (23%) had red backgrounds and 51 (11%) had cream backgrounds.

Additional Slips: 124 (27%) had no additional slips, 124 (27%) had red and black additional slips, 96 (20%) had red slips, 72 (15.6%) had black slips, 2 (0.4%) had red orange and black slips, 11 (2.4%) were red and orange, 4 (0.9%) were orange and black, 4 (0.9%) were just orange, 3 (0.6%) were red, black and other colors and 2 (0.4%) were just other colors.

Designs Present: 45 (9.7%) had a general geometric design, 12 (2.6%) had a simple geometric design, 2 (0.4%) had both a geometric design and pseudoglyphs, and 2 (0.4%) had a geometric design and glyphs. 4 (0.9%) had a general figural design, 1 (0.2%) had figural humans and animals as well as glyphs, and 1 (0.2%) had a general pseudoglyphic design. 12 (2.6%) had designs but the designs were indeterminate.

Additional Decorations: 3 (0.6%) had inclusions.

Location of Design: 61 (13.2%) had the design on the exterior with none on the interior, 27 (5.8%) had the design on the interior and none on the exterior, 2 (0.4%) had a main design on the interior with a secondary design on the exterior, 8 (1.7%) had a main design on the exterior with a secondary design on the interior, 8 (1.7%) had a design on the interior but the exterior was too eroded to determine if there was a design, and 11 (2.4%) had a design on the exterior but the interior was too eroded to determine if there was a design. The location was indeterminate for 185 pieces.

Rim/Lip Slip: 127 (27%) were red, 34 (7.3%) were black, 24 (5.2%) had a black lip and red on the rim, 5 (1.1%) were orange and 1 (0.2%) was black and orange. 270 (58%) were absent.
Operation 17

Group C

Form Class: There were 123 pieces in operation 17. There were 35 (28%) tripod plates, 19 (15%) dishes or bowls with rounded sides, 11 (9%) dishes or bowls with flared or outcurved sides, 11 (9%) cylinder vases, 7 (5.7%) closed indeterminate pieces, 1 (0.8%) drum and 1 (0.8%) jar. There was also 35 indeterminate open forms and 3 just indeterminate pieces.

Lip: 32 (26%) had rounded lips, 21 (17.1%) had beveled lips, 7 (5.7%) had square or flattened lips, 7 (5.7%) pointed lips and 8 were indeterminate. There were 48 (39%) pieces with the lips absent.

Rim: 62 (50%) had direct rims, 13 (10%) were slightly flaring to flaring and 1 (0.8%) was slightly incurved and exteriorly thickened. 47 (38%) were missing the rim.

Wall Type: 26 (21%) were outflared, 15 (12%) were slightly outcurved, 9 (7.3%) were between outcurved and very outcurved, 16 (13%) were open and rounded, 4 (3.3%) were incurved and rounded, 11 (8.9%) were vertical and 2 (1.6%) were recurved. 40 were either indeterminate, absent or not applicable.

Special Body Sherd: 3 (2.4%) had ridges, 2 (1.6%) had notched ridges, 2 (1.6%) had otherwise modified ridges, 3 (2.4%) had angles and 1 (0.8%) had a neck.

Base: 72 (58%) had no base. 31 (25%) had open and flat bases, 18 (15%) had open and flat bases with tripod feet.

Foot Form: There were 8 (6.5%) with indeterminate forms and one that was a round-bottomed, hollow oven foot.

Rim Diameter: There were 58 valid rim diameters. The mean was 19.7 cm with a standard deviation of 7.7 cm.
Wall Thickness: There were 121 valid entries for wall thickness. The mean was 0.76 cm with a standard deviation of 0.14 cm.

![Wall Thickness](image)

Vessel Height: There were 11 valid entries for vessel height. The mean was 3.97 cm with a standard deviation of 1 cm. The smallest was 2.6 cm and the largest was 6.2 cm.

Paste Color:
- There were 5 (4.0%) pieces in 2.5 YR. There were 4 that were light reddish brown and 1 that was weak red.
- There were 10 (8.1%) pieces in 5 YR. There were 7 reddish yellow and 3 yellowish red.
  - 7 were in category B
- There were 48 (39.1%) pieces in 7.5YR. There were 30 that were reddish yellow, 10 that were strong brown, 4 that were brown, 2 that were light brown and 2 that were pink.
  - 7 were in Category C
- There were 60 (48.7%) in 10 YR, the most common hue. There were 21 that were brownish yellow, 11 that were light yellowish brown, 10 that were very pale brown and 9 that were yellow. There were also 2 that were yellowish brown, 5 that were brown, 1 that was very dark gray and 1 that was grayish brown.
19 were in category E

**Paste Type:**

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Inclusions: There were no inclusions recorded.

Presence of a Core: 13 (10%) had a narrow core, 35 (28%) had a wide core, half of the interior was dark on 2 (1.6%) of them, half of the exterior was dark on 2 (1.6%) of them. The core was absent on 70 (57%) of them. In total, 38% had cores.

Fireclouds: There were no fireclouds.

Underslip: 55 (45%) had either a white or cream underslip and 20 (16%) had orange underslips. 44 (36%) had no underslip and 4 (3.3%) were indeterminate.

Background Slip: 51 (41%) had red background slips and 16 (13%) had orange background slips. 41 (33%) had no background slip and 15 (12.2%) were indeterminate.

Additional Slips: 12 (10%) had red slips, 14 (11%) had black slips, and 1 (0.8%) had both red and black slips. 95 (77%) had no other slips and 1 (0.8%) was indeterminate.

Designs Present: There were 122 (99%) with no design and 1 (0.8%) that was indeterminate.

Additional Decoration: 4 (3.3%) had incisions and 1 (0.8%) had modeling.

Location of Designs: Despite the absence of design information there is information for the location of designs. 2 (1.6%) had designs only on the interior, 4 (3.3%) had designs only on the exterior, 18 (14.6%) had a design on the exterior but the interior was too eroded and 17 (13.8%) had a design on the interior but the exterior was too eroded. It also said 79 were indeterminate.

Rim/Lip Slip: 5 (4.1%) were red, 3 (2.4%) were black and 3 (2.4%) had black on the lip and red on the rim. 112 (91%) had no slip on the rim.
Operations 19, 20 and 30

Group C, B/E

Form Class: There were 69 total pieces between these three operations. There were 3 pieces in 19, 24 pieces in 20 and 42 pieces in 30. There were 13 (19%) forms that were tripod plates, 10 (14.5%) dishes or bowls with flared or outcurved sides, 5 (7.2%) dishes or bowls with rounded sides, and one (1.4%) cylinder vase. There were 3 (4.3%) completely indeterminate pieces, 3 (4.3%) closed indeterminate and 34 (49%) open indeterminate.

Lip: 25 (36%) had rounded lips, 10 (14%) had beveled lips, 4 (5.8%) had pointed lips, 1 (1.4%) had a square lip and 1 (1.4%) had a grooved lip. The others did not have a lip present or it was indeterminate.

Rim: 33 (48%) had direct rims and 9 (13.0%) had slightly flaring to flaring rims. The others did not have a rim present or it was indeterminate.

Wall Type: 21 (30%) had outflared walls, 9 (13.0%) had slightly outcurved walls, 1 (1.4%) had very outcurved walls, 7 (10.1%) had open and rounded walls, 1 (1.4%) had incurved and rounded walls and 1 (1.4%) had vertical walls.

Special Body Sherds: 2 (3.0%) had ridges.

Base: 22 (32%) had open flat bases, 6 (8.7%) had open flat bases with tripod feet, 1 (1.4%) had an open rounded base with tripod feet, and 1 (1.4%) had a closed direct base.

Foot Form: 5 (7.2%) had feet but the forms were all indeterminate.

Rim Diameter: There were 18 valid pieces of data for rim diameter. The mean was 24.2 cm with a standard deviation of 7.2 cm. They were between 13 cm and 34 cm. The mean was higher than Operations 2, 15, 17, 29 and all of Group A.
Wall Thickness: The mean wall thickness was 0.76 cm with a standard deviation of 0.17 cm.

Vessel Height: There were 6 valid pieces of data for vessel height. There was one vessel each that was 2.7 cm, 3.4 cm, 4.4 cm, 4.7 cm, 5.8 cm, and 6.1 cm.

Paste Color:
- There was only 1 (1.4%) piece in 2.5 YR which was reddish yellow.
- There was only 2 (2.9%) pieces in 5 YR. Both were yellowish red.
- In 7.5 YR, there were 42 (60.8%) pieces which was the most common. 22 were reddish yellow, 19 were strong brown and 1 was light brown.
  - 4 were in category C
- In 10 YR, there were 24 (34.7%) pieces. 10 were brownish yellow, 6 were yellow, 3 were very pale brown, 3 were yellowish brown, 1 was light yellowish brown and 1 was brown.
  - 9 were in category E

Paste Type: approximately 32% had calcite.

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Inclusions: 26 (38%) had ferruginous as inclusions, 13 (19%) had carbon and 3 had both.

Presence of a Core: 22 (32%) had wide cores and 10 (14%) had narrow cores totaling 46% of all.

Fireclouds: 11 (16%) had fireclouds present and 24 were indeterminate.

Underslip Color: 49 (71%) had white or cream underslips and 3 had orange underslips.

Background Slip Color: 38 (55%) had orange backgrounds and 26 (38%) had red backgrounds. There were very few that had cream backgrounds.

Additional Slips: 12 had red slips, 9 had black slips, 8 had red and black slips and 1 had red, black and other colored slips.

Designs Present: 5 had general geometric designs, 2 had general glyphic designs and 1 had a pseudoglyphic design.

Additional Decoration: 3 had incisions.

Location of Designs: 1 had the design on the interior with nothing on the exterior, 6 had the design on the exterior with nothing on the interior, 11 (16%) had a design on the interior but the exterior was eroded, and 4 had a design on the exterior while the interior was too eroded to distinguish if a design was present. There were also 11 where the location of the design was indeterminate.

-There was none with secondary designs.

Rim/Lip Slip: 16 (23%) were red, 4 were black and 1 was black on the lip and red on the rim.
**Operation 29**

General Form: There were 53 total pieces in Operation 29. 13 (24%) were dishes or bowls with rounded sides, 11 (21%) were tripod plates, 6 (11.3%) were dishes or bowls with flared or outcurved sides and 4 (7.5%) were cylinder vases. 2 (3.8%) were completely indeterminate, 2 (3.8%) were closed indeterminate and 15 (28.3%) were open indeterminate.

Lip: 10 (19%) had rounded lips, 8 (15%) had beveled lips, 4 (7.5%) had square lips and 2 (3.8%) had pointed lips. The majority, 29 (55%) did not have lips present.

Rim: 15 (28%) had direct rims, 5 (9.4%) had slightly flaring to flaring rims and 2 (3.8%) had everted rims. 2 (3.8%) were indeterminate and 29 (55%) were missing rims.

Wall Type: 5 (9.4%) were outflared, 4 (7.5%) were outcurved, 2 (3.8%) were open and rounded, 4 (7.5%) were incurved and rounded and 3 (5.7%) were vertical. 35 were either indeterminate or missing the wall.

Special Body Sherd: one (1.9%) piece had an angle.

Base: 19 (36%) have open flat bases, 4 (7.5%) had open flat bases with tripod feet, 1 (1.9%) was open and rounded with tripod feet, 1 (1.9%) was open and convex and 1 was closed and direct. 24 (45%) were missing the base.

Foot Form: 2 (3.8%) had hollow oven feet with flat bottoms, 1 (1.9%) had hollow oven feet with rounded bottoms and 2 (3.8%) had hollow oven feet but the bottoms were missing. 1 (1.9%) had solid conical feet, 1 (1.9%) had solid slab feet and 2 (3.8%) had indeterminate feet.

Rim Diameter: There were 7 instances of valid rim diameter with values between 12 cm and 35 cm. The mean was 21.6 cm with a standard deviation of 9.7 cm. The mean rim diameter is close to that of Operation 2 and 15.
Wall Thickness: The mean wall thickness was 0.69 cm with a standard deviation of 0.13 cm. This operation had thinner walls than the North Zone.

![Wall Thickness](chart)

Vessel Height: There was only one record of vessel height: 3.2 cm.

Feet Height: There were 2 pieces of data for feet height. one was 1.3 cm and the other was 1.6 cm.

Paste Color: The paste colors are more evenly dispersed than in many of the other operations.

- There was one (1.9%) in 2.5Y which was pale yellow.
- In 2.5YR, there were 7 (13.2%) pieces. There were 3 red and 4 light red.
  - 7 were in category A
- In 5YR, there were 12 (22.6%) pieces. There were 8 reddish yellow, 3 yellowish red and 1 dark reddish brown.
o There were 8 in category B

- In 7.5YR, there were 15 (28.3%) pieces. There were 9 reddish yellow, 4 strong brown, 1 pink and 1 brown.

  o There were 5 in category C

- In 10 YR, there were 17 (32.1%) pieces which was the most common. There were 5 very pale brown, 4 yellow, 3 brownish yellow, 2 yellowish brown, 1 dark yellowish brown, 1 dark brown, and 1 light yellowish brown.

  o 9 were in category E

Paste Type: Paste profile is similar to the North Zone as it has rare calcite tempers.

<table>
<thead>
<tr>
<th>Paste Type</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>mixed calcite and quartz medium</td>
<td>1</td>
<td>1.9</td>
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<tr>
<td>volcanic tempered ash, fine</td>
<td>4</td>
<td>7.5</td>
</tr>
<tr>
<td>tempered sand/quartz, fine</td>
<td>14</td>
<td>26.4</td>
</tr>
<tr>
<td>tempered sand/quartz, medium</td>
<td>2</td>
<td>3.8</td>
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<tr>
<td>mixed volcanic and quartz medium</td>
<td>13</td>
<td>24.5</td>
</tr>
<tr>
<td>volcanic ash-tempered, medium</td>
<td>18</td>
<td>34.0</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>100</td>
</tr>
</tbody>
</table>

Inclusions: 30 (57%) had ferruginous as inclusions, 4 had carbon, 3 had both carbon and ferruginous and one had concha.

Presence of a Core: 11 (21%) had wide cores, 4 had narrow cores, half the interior was dark on one of them and half of the exterior was dark on another. In total 28% had cores.

Fireclouds: 15 (28%) had fireclouds. 15 were indeterminate and 23 were absent.

Underslip: 17 (32%) had white or cream underslips and 4 (7.5%) had orange underslips. 6 (11.3%) were indeterminate and 26 (49%) had no underslip.

Background Slip: 28 (53%) had orange background slips, 16 (30%) had red background slips, and 3 (5.7%) had cream background slips. 5 were indeterminate and 1 had no background slip. There were very few cream background slips.
Additional Slips: 13 (25%) had red slips, 14 (26%) had black slips, 3 (5.7%) had red and black slips, and 1 (1.9%) had orange and red slips. 22 had no additional slips.

Designs Present: 3 (5.7%) had general geometric designs.

Location of Designs: 4 (7.5%) had designs on the interior and none on the exterior, 7 (13.2%) had designs on the exterior and none on the interior, 4 (7.5%) had a main design on the interior and a secondary design on the exterior, 1 (1.9%) had a main design on the exterior and a secondary design on the interior and the location was indeterminate on 8 pieces.

Rim/Lip Slip: 10 (19%) were red, 4 (7.5%) were black, and 2 (3.8%) were black on the lip and red on the rim.

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**Operation 33**

Group C

Form Class: There were 80 total pieces in operation 33. There were 7 (8.8%) tripod plates and 4 (5.0%) dishes or bowls with flared or outcurved sides. The rest were indeterminate. There were 7 (8.8%) indeterminate, 59 (74%) open indeterminate, and 3 (3.8%) closed indeterminate.

Lip: 22 (27%) had rounded lips, 7 (8.8%) had beveled lips, 5 (6.2%) had pointed lips and 2 (2.5%) had square or flattened lips. There were 44 pieces with the lips absent.

Rim: 32 (40%) had direct rims and 4 (5.0%) had everted rims. The rims were absent on 44 other pieces.

Wall Type: 15 (19%) were outflared, 2 (2.5%) were slightly outcurved, 1 (1.2%) was vertical and the rest were either indeterminate, absent or not applicable.

Special Body Sherd: There was 1 (1.2%) with a ridge and 1 (1.2%) with a modified ridge that wasn’t notched.

Base: 33 (41%) had open, flat bases, 4 (5.0%) had open flat bases with tripod feet and 1 (1.2%) had an open convex base. The other 52% either did not have the base present or it was indeterminate.

Foot Form: 2 (2.5%) had hollow oven feet and were flat bottomed, 1 (1.2%) had hollow oven feet with rounded bottoms, and 1 (1.2%) had hollow oven feet but the bottom of the foot was absent. There were also 4 (5.0%) indeterminate feet.

Rim Diameter: There were only 9 valid entries ranging between 13 cm and 35 cm. The mean was 22.6 cm with a standard deviation of 8.2 cm.
Wall Thickness: The mean wall thickness was 0.72 cm with a standard deviation of 0.15 cm.

Vessel Height: There were two valid entries for vessel height: 3.0 cm and 3.5 cm.

Feet Height: There were two valid entries for feet height: 2.6 cm and 5.3 cm.

Paste Color: There were none in 2.5YR and there where only colors with cromas of 8 in 5YR.

- There was one (1.2%) in 2.5Y which was light yellowish brown
- In 5 YR, there were 5 (6.2%) in total, 4 in yellowish red and one in reddish yellow
  - 1 was in category B
- There were 55 (68.7%) 7.5 YR, the most common hue. 29 were reddish yellow, 12 strong brown, 7 pink, 3 light brown, 1 brown, and three between brown and dark brown.
  - There were 16 in category C.
• In 10 YR, there were 19 (23.7%) in total, 5 in yellowish brown, 3 in brownish yellow, 3 in light yellowish brown, 4 in yellow and 4 in very pale brown.
  o There were 8 in category E.

Paste Type: There were only three paste types. 47 (59%) were medium grained tempered volcanic ash, 24 (30%) were fine grained tempered calcite, and 9 (11%) had a medium grained volcanic and quartz mix.

Inclusions: 67 (84%) had ferruginous as inclusions, 9 (11%) had carbon, 3 (3.8%) had both ferruginous and carbon and 1 (1.2%) had mica.

Presence of Core: 29 (36%) had a wide cores, 4 (5.0%) had narrow cores, 44 (55.0%) had no core and 3 (3.8%) were indeterminate. In total 41.25% had cores.

Fireclouds: 11 (14%) had fireclouds, 25 had no fireclouds and 44 were indeterminate.

Underslip: 75 (94%) had white or cream underslips. The other 5 (6%) were indeterminate.

Background Slip: 64 (80%)had orange backgrounds, 8 (10%) had red backgrounds, 5 (6.2%) had cream backgrounds and 3(3.8%) were indeterminate.

Additional Slips: 34 (42%) had red slips, 4 (5.0%) had black slips and 7 (8.8%) had red and black slips. There were 35 with no additional slips.

Designs Present: There was only one piece with any designs on it and that was a general geometric design.

Additional Decoration: there were 2 (2.5%) with incisions.

Location of Designs: There were three pieces with information in this category. 1 (1.2%) had a design on the interior and nothing on the exterior and 2 (2.5%) had a design on the exterior and nothing on the interior.

Rim/Lip Slip: 23 (29%) had red rims and lips and 2 (2.5%) had black rims and lips.
**Group A: Operations 8,9,10,13 and 16**

Form Class: There were 91 total pieces in Group A. There were 30 in Operation 8, 5 in Operation 9, 31 in Operation 10, 24 in Operation 13 and 1 in Operation 16. 19 (20.9%) were tripod plates, 11 (12.1%) were dishes or bowls with rounded sides, 6 (6.6%) were cylinder vases and 5 (5.5%) were dishes or bowls with flared or outcurved sides. 9 (9.9%) were indeterminate, 1 (1.1%) was closed indeterminate and 39 (43%) were open indeterminate.

Lip: 37 (41%) had rounded lips, 11 (12%) had beveled lips, 5 (5.5%) had pointed lips, and 3 (3.3%) had square lips. The others were either missing the lip or were indeterminate.

Rim: 52 (57%) had direct rims and 6 had slightly flaring to flaring rims. The others were either missing the rim or were indeterminate.

Wall Type: 23 (25%) had outflared walls, 3 (3.3%) had slightly outcurved walls, 1 (1.1%) had outcurved walls, 6 (6.6%) had open rounded walls, 5 (5.5%) had incurved rounded walls and 6 (6.6%) had vertical walls. The others were either missing the wall or were indeterminate.

Special Body Sherd: 4 (4.4%) had ridges, 1 (1.1%) had a modified ridge and 1 (1.1%) had an angle.

Base: 19 (21%) had open, flat bases, 7 (7.7%) had open, flat bases with tripod feet, and 1 (1.1%) was open with a ring. The others were either missing the wall of were indeterminate.

Foot Form: 1 (1.1%) had hollow oven feet with flat bottoms, 1 (1.1%) had solid slab feet and 3 were indeterminate.

Rim Diameter: There were 34 valid pieces of rim diameter data. The mean was 20.7 cm with a standard deviation of 8.7 cm.
Wall Thickness: The mean wall thickness was 0.72 cm with a standard deviation of 0.15 cm.

Vessel Height: There were 7 pieces of valid data for vessel height. There was one at 2.2 cm, 3.2 cm, 4.6 cm, 5.0 cm, 7.0 cm and 2 at 3.8 cm. The mean was 4.2 cm with a standard deviation of 1.5 cm.

Feet height: There was one instance for feet height and it had a value of 1.

Paste Color:
- In 5 YR, there were 25 (25.2%). 16 were yellowish red, 7 where reddish yellow, 1 was light reddish brown and 1 was reddish brown.
  - 7 were in category B
- In 7.5YR, there were 46 (46.5%). 25 were reddish yellow, 16 were strong brown, 3 were brown and 2 were light brown.
  - 5 were in category C
- In 10 YR, there were 28 (28.3%). 7 were brownish yellow, 5 were yellow, 4 were very pale yellow, 6 were light yellowish brown, 2 were yellowish brown, 1 was pale brown, 2 were brown and 1 was between brown and dark brown.
  - 9 were in category E
Paste Type: over 56% had calcite.

<table>
<thead>
<tr>
<th>Paste Type</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>mixed calcite and quartz medium</td>
<td>15</td>
<td>16.5</td>
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<tr>
<td>calcite-tempered, fine</td>
<td>39</td>
<td>42.9</td>
</tr>
<tr>
<td>calcite-tempered, medium</td>
<td>6</td>
<td>6.6</td>
</tr>
<tr>
<td>volcanic tempered ash, fine</td>
<td>3</td>
<td>3.3</td>
</tr>
<tr>
<td>tempered sand/quartz, fine</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>mixed volcanic and quartz medium</td>
<td>16</td>
<td>17.6</td>
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<tr>
<td>volcanic ash-tempered, medium</td>
<td>11</td>
<td>12.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>91</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Inclusions: 26 (29%) had ferruginous inclusions, 6 had carbon, 1 had both and 1 had volcanic ash.

Presence of a Core: 11 (12%) had a narrow core, 14 (15%) had a wide core, half of the interior was dark on one and half of the exterior was dark on 3 of them.

Fireclouds: 5 (5%) had fireclouds. 26 (37%) were indeterminate.

Underslip Color: 56 (61%) had white or cream underslips and 3 had orange underslips. 11 were indeterminate and 21 did not have an underslip.

Background Slip: 42 (46%) had red background slips, 27 (30%) had orange slips and 4 had cream background slips.

Additional Slips: 18 (20%) had red slips, 9 (9.9%) had black slips, 5 (5.5%) had both red and black slips and one (1.1%) had orange and black slips.

Designs Present: 1 (1.1%) had a simple geometric design and 2 (2.2%) were indeterminate. The rest had no design.

Additional Decoration: 3 (3.3%) had incisions.

Locations of Designs: 6 (6.6%) had designs on the exterior and none on the interior, 6 (6.6%) had designs on the exterior but the interior was too eroded to tell if there was a design and 1 (1.1%) had a design on the interior but the exterior was too eroded to tell if there was a design. The location was indeterminate on 45 of them.
Rim/Lip Slip: 21 (23%) were red and 3 (3.3%) were black.

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**Group B: Operations 7, 11, 12 and 14**

Form Class: There were 26 total pieces from these 4 operations. 5 were in operation 7, 1 was in operation 11, 9 were in operation 12 and 11 were in operation 14. 3 (11.5%) were tripod plates, 2 (7.7%) were cylinder vases, 3 (11.5%) were dishes or bowls with rounded sides and 2 (7.7%) were dishes or bowls with flared or outcurved sides. In addition there were 3 (11.5%) indeterminate, 1 (3.8%) closed indeterminate and 12 (46.2%) open indeterminate.

Lip: 5 (19.2%) had rounded lips, 6 (23.1%) had beveled lips, 1 (3.8%) had a square lip, 1 (3.8%) had a pointed lip and 13 (50.0%) were either indeterminate or absent.

Rim: 9 (34.6%) had direct rims, 3 (11.5%) had slightly flaring to flaring rims and 2 (7.7%) had everted rims.

Wall Type: 5 (19.2%) had outflaring walls, 1 (3.8%) had outcurved walls, 3 (11.5%) had open, rounded walls, 2 (7.7%) had vertical walls and 6 (23.1%) were indeterminate.

Special Body Sherd: 2 (7.7%) had ridges and 1 (3.8%) had a notched ridge.

Base: 10 (38.5%) had open, flat bases, 2 (7.7%) had open, flat bases with tripod feet and 3 (11.5%) were indeterminate.

Foot Form: 2 (7.7%) had indeterminate feet.

Rim Diameter: There were only 4 values for rim diameter: one was 8 cm, one was 15 cm, one was 27 cm and one was 38 cm.
Wall Thickness: The wall thickness had a mean of 0.72 cm with a standard deviation of 0.15 cm. The mean is thinner than those operations in the North Zone.

![Wall Thickness Chart]

Vessel Height: There were three values for vessel height. One at 2.7 cm, one at 2.9 cm and one at 3.7 cm.

Paste Color:

- In 5 YR, there were 4 (15.3%) total pieces. 3 were yellowish red and 1 was reddish yellow.
  - 1 was in category B

- In 7.5 YR, there were 15 (57.7%) total pieces which was the most common. 9 were reddish yellow, 4 were strong brown and 2 were brown.
  - 1 was in category C

- In 10 YR, there were 6 (23.0%) total pieces. 2 were brownish yellow, 1 was yellow, 1 was light yellowish brown, 1 was grayish brown and 1 was dark yellowish brown.
  - 1 was in category E
Paste Type: 46% had calcite.

<table>
<thead>
<tr>
<th>Paste Type</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>mixed calcite and quartz medium</td>
<td>2</td>
<td>7.7</td>
</tr>
<tr>
<td>calcite-tempered, fine</td>
<td>10</td>
<td>38.5</td>
</tr>
<tr>
<td>volcanic tempered ash, fine</td>
<td>2</td>
<td>7.7</td>
</tr>
<tr>
<td>mixed volcanic and quartz medium</td>
<td>9</td>
<td>34.6</td>
</tr>
<tr>
<td>volcanic ash-tempered, medium</td>
<td>3</td>
<td>11.5</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>100</td>
</tr>
</tbody>
</table>

Inclusions: 9 (34.6%) had ferruginous, 3 (11.5%) had carbon and 1 (3.8%) had both carbon and ferruginous.

Presence of a Core: 1 had a narrow core and 4 had wide cores. 19% of the pieces had cores.

Fireclouds: 13 were indeterminate but there were no visible fireclouds present.

Underslip: 13 (50%) had white or cream underslips and 2 (7.7%) had orange underslips. In addition 7 were indeterminate.

Background Slip: 14 (54%) had orange backgrounds, 9 (34.6%) had red backgrounds and 1 (3.8%) had a cream background.

Additional Slips: 7 (26.9%) had red slips, 3 (11.5%) had black slips and 2 (7.7%) had red and black slips.

Designs Present: 2 (7.7%) had indeterminate designs

Location of Designs: 1 had the design on the exterior with nothing on the interior and 2 had a design on the interior but the exterior was too eroded to distinguish if there was a second design. 9 were indeterminate.

Rim/Lip Slip: 6 (23.1%) were red.
Upper North: Operations 31, 35, 38, 42 and 45

General Form Class: There were 259 pieces in these 5 operations that make up the upper region of the north quadrant. There were 136 pieces in operation 31, 75 in operation 42, 40 in operation 35, 6 in operation 38 and 2 in operation 45. 85 (33%) were dishes or bowls with flared or outcurved sides, 31 (12%) were dishes or bowls with rounded sides, 27 (10%) were tripod plates and 11 (4.2%) were cylinder vases. There were 2 (0.8%) closed indeterminate pieces and 1 (0.4%) drum. There were 96 (37%) open indeterminate pieces and 6 completely indeterminate pieces.

Lip: 92 (35%) had rounded lips, 26 (10%) had square or flattened lips, 22 (8.5%) had beveled lips, 15 (5.8%) had pointed lips and the rest (102) did not have the lip present.

Rim: 97 (37%) had direct rims, 39 (15%) had slightly flaring to flaring rims, 7 (2.7%) had interiorly thickened rims, 2 (0.8%) were everted, 5 (1.9%) were slightly incurved and exteriorly thickened and 3 (1.2%) were slightly outflaring and exteriorly thickened. The other 104 either had the rim absent or it was indeterminate.

Wall Type: 88 (34%) were outflared, 20 (8%) were slightly outcurved, 23 (9%) were outcurved to very outcurved, 9 (3.5%) had open and rounded walls, 23 (9%) had incurved, rounded walls, 12 (4.6%) had vertical walls and 4 (1.5%) had recurved walls. The others were either absent, indeterminate or not applicable.

Special Body Sherd: 11 (4.2%) had ridges, 1 (0.4%) had a notched ridge, 5 (1.9%) had otherwise modified ridges and 8 had angles.

Base: 62 (24%) had open, flat bases, 18 (6.9%) had open, flat bases with tripod feet, 1 (0.4%) was open, rounded with tripod feet and 3 (1.2%) were open and convex.

Foot Form: 3 (1.2%) were hollow oven feet but were missing the bottoms, 3 (1.2%) were hollow oven feet with flat bottoms, 1 (0.4%) had IK feet, and 14 (5.4%) were indeterminate.

Rim Diameter: The mean rim diameter was 23.6 cm with a standard deviation of 8.5 cm.
Wall Thickness: The mean wall thickness was 0.74 cm with a standard deviation of 0.16 cm.

![Wall Thickness Chart]

Vessel Height: There were 8 valid data entries for vessel height. They had a mean of 3.6 cm with a standard deviation of 0.9 cm. There was one at 1.9 cm, one at 3 cm, one at 3.3 cm, two at 3.5 cm, one at 4.1 cm, one at 4.3 cm and one at 5 cm.

Feet Height: There was only one valid entry for feel height which was 3.3 cm.

Paste Color:

- In 2.5Y, there was one olive yellow.
- There were 17 (6.5%) in 2.5YR. There were 8 red and 9 light red.
  - All 17 were in category A.
There were 59 (22.7%) in 5 YR. 34 were reddish yellow, 23 were yellowish red, 1 was light reddish brown and 1 was between yellowish red and reddish brown.

- 34 were in category B

There were 118 (45.5%) in 7.5YR, the most common hue. 63 were reddish yellow, 30 were strong brown, 9 were pink, 8 were brown, 4 were light brown, 1 was between pink and reddish yellow, and 3 were between brown and dark brown.

- 35 were in category C

There were 62 (23.9%) in 10 YR. There were 16 brownish yellow, 13 yellow, 12 yellowish brown, 7 very pale brown, 4 light yellowish brown, 1 dark yellowish brown, 1 brown, 1 dark brown, 3 between brown and dark brown, 1 between brownish yellow and light yellowish brown, 1 light gray and 2 between yellow and very pale brown.

- 22 were in category E.

Paste Type:

<table>
<thead>
<tr>
<th>Paste Type</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>calcite-tempered, fine</td>
<td>22</td>
<td>8.5</td>
</tr>
<tr>
<td>calcite-tempered, medium</td>
<td>3</td>
<td>1.2</td>
</tr>
<tr>
<td>volcanic tempered ash, fine</td>
<td>41</td>
<td>15.8</td>
</tr>
<tr>
<td>tempered sand/quartz, fine</td>
<td>13</td>
<td>5.0</td>
</tr>
<tr>
<td>tempered sand/quartz, medium</td>
<td>11</td>
<td>4.2</td>
</tr>
<tr>
<td>mixed volcanic and quartz medium</td>
<td>54</td>
<td>20.8</td>
</tr>
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<td>volcanic ash-tempered, medium</td>
<td>113</td>
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<tr>
<td>Total</td>
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<td>100.0</td>
</tr>
</tbody>
</table>

Inclusions: 162 (62%) had ferruginous as inclusions, 25 (10%) had carbon, 27 (10%) had both carbon and ferruginous, 2 (0.8%) had mica, and 3 (1.2%) had concha.

Presence of a Core: 31 (12%) had narrow cores, 75 (30%) had wide cores, half of the interior was dark on 1 (0.4%) piece and half of the exterior was dark on 4 (1.5%) pieces. The other 148 had no core. In total there were 42% that had cores.

Fireclouds: 73 (28%) had fireclouds present and another 38 (15%) were indeterminate.

Underslip: 123 (47%) had a white or cream underslip, 9 (3.5%) had orange underslips, 16 (6.2%) were indeterminate but 108 (42%) had no underslip.
Background Slip: 144 (56%) had orange backgrounds, 36 (14%) had red backgrounds and 32 (12%) had cream backgrounds.

Additional Slips: 84 (32%) had red slips, 24 (9%) had black slips, 87 (34%) had red and black slips, 7 (2.7%) had orange and red slips, 3 (1.2%) had orange and black slips, 10 (3.9%) had orange, red and black slips, and 4 (1.5%) had red black and other colored slips.

Designs Present: 42 (16%) had general geometric designs and 4 (1.5%) had simple geometric designs.

Additional Decoration: 1 (0.4%) had an incision, 3 (1.2%) had fluting, and 1 (0.4%) had negative or resist painting.

Location of Designs: 15 (5.8%) had designs on the interior with nothing on the exterior, 39 (15%) had designs on the exterior with nothing on the interior, 6 (2.3%) had the main design on the interior and a secondary design on the exterior, 9 (3.5%) had a main design on the exterior and a secondary design on the interior and 3 (1.2%) had designs on the exterior while the interior was too eroded to distinguish a design.

Rim/Lip Slip: 77 (30%) were red, 21 (8.1%) were black, 7 (2.7%) had black on the lip and red on the rim, 4 (1.5%) were orange, and 2 (0.8%) were black and orange.

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**Lower North: Operations 26, 23 and 39**

Form Class: There were 76 total pieces. 34 pieces were from operation 23, 1 piece was from operation 26 and 41 pieces were from operation 39. 28 (37%) were tripod plates, 9 (12%) were cylinder vases, 8 (10%) were dishes or bowls with rounded sides and 15 (20%) were dishes or bowls flared or outcurved sides. Another 16 (21%) were open indeterminate pieces.

Lip: 31 (41%) had rounded lips, 9 (12%) had beveled lips, 7 (9.2%) had square or flattened lips and 1 (1.3%) had a pointed lip. The others were either missing or indeterminate.
Rim: 28 (37%) had direct rims, 18 (24%) had slightly flaring to flaring rims, 1 (1.3%) had an everted rim, 2 (2.6%) had interiorly thickened rims and 1 (1.3%) had an exteriorly thickened rim. The others did not have a rim present.

Wall Type: 21 (28%) had outflared walls, 11 (15%) had slightly outcurved walls, 4 (5.3%) had outcurved walls, 9 (11.8%) had vertical walls, 3 (3.9%) had open, rounded walls, 5 (6.6%) had incurved, rounded walls, and one (1.3%) had recurved walls. The others were either indeterminate or the wall was absent.

Special Body Sherd: 3 (3.9%) had ridges, and 1 (1.3%) had a notched ridge.

Base: 15 (19.7%) had open and flat bases, 17 (22.4%) had open, flat bases with tripod feet. The others were either indeterminate or missing the base.

Foot Form: 6 (7.9%) had hollow, oven feet but the bottom of the feet were absent, 1 (1.3%) had hollow oven feet with flat bottoms, 3 (3.9%) had hollow oven feet with rounded bottoms. 2 (2.6%) were indeterminate.

Rim Diameter: The mean rim diameter was 22.7 cm with a standard deviation of 7.9 cm.

Wall Thickness: The mean wall thickness was 0.78 cm with a standard deviation of 0.14.
Vessel Height: There were 9 valid instances of data. The mean was 4.5 cm with a standard deviation of 1.4 cm.

Feet Height: There were 4 valid instances of feet height. 1 was 1.7 cm, 1 was 2.2 cm, 1 was 3.2 cm and one was 3.8 cm.

Paste Color:

- In 2.5 YR, there were 6 (8.0%) pieces in total. 4 were light red, 1 red and 1 that was between reddish brown and weak red.
  - 4 were in category A.

- There were 25 (33%) in 5 YR. 17 were reddish yellow and 8 were yellowish red.
  - 17 were in category B

- There were 19 (25%) in 7.5 YR. 17 were reddish yellow and 2 were brown.
7 were in category C

- There were 25 (33%) in 10 YR. 8 were yellow, 7 were very pale brown, 4 were brownish yellow, 4 were light yellowish brown, 1 was light brownish gray and 1 was between yellow and very pale brown.

16 were in category E

Paste Type:

<table>
<thead>
<tr>
<th>Paste Type</th>
<th>Frequency</th>
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<td>28.9</td>
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<td>5.3</td>
</tr>
<tr>
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</tr>
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<td>11.8</td>
</tr>
<tr>
<td>tempered sand/quartz, medium</td>
<td>3</td>
<td>3.9</td>
</tr>
<tr>
<td>mixed volcanic and quartz medium</td>
<td>9</td>
<td>11.8</td>
</tr>
<tr>
<td>volcanic ash-tempered, medium</td>
<td>4</td>
<td>5.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>74</strong></td>
<td><strong>100.0</strong></td>
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Inclusions: 13 (17%) had ferruginous as inclusions, 2 (2.6%) had mica, 1 (1.3%) had concha, 1 (1.3%) had ferruginous and carbon and 1 (1.3%) had volcanic ash.

Presence of a Core: 12 (16%) had narrow cores, 18 (24%) had wide cores, and half of the exterior was dark on one. In total 40% had cores.

Fireclouds: 8 (19.5%) had fireclouds present.

Underslip: 18 (24%) had white or cream underslips, 9 (12%) had orange underslips.

Background Slips: 30 (40%) had red background slips, 26 (34%) had orange background slips, 5 (6.6%) had cream background slips. 7 (9.2%) had no background slips and 8 were indeterminate.

Additional Slips: 19 (25%) had additional red slips, 7 (9.2%) had black slips, 10 (13.2%) had both red and black slips, 1 (1.3%) had an orange slip, 2 (2.6%) had orange and black slips, 2 (2.6%) had orange, red and black slips, 1 (1.3%) had red, black and other colors and 34 had no additional slips.

Designs Present: 3 (3.9%) had general geometric designs, 1 (1.3%) had figural humans and glyphs, and 2 (2.6%) were indeterminate.
Additional Decoration: 1 (1.3%) had an incision, and 1 (1.3%) was grooved.

Location of Designs: 6 (7.9%) had designs on the interior and nothing on the exterior, 5 (6.6%) had designs on the exterior and nothing on the interior, 1 (1.3%) had a main design on the interior and a secondary design on the exterior, 4 (5.3%) had a main design on the exterior and a secondary design on the interior, 18 (23.7%) had design on the interior but the exterior was too eroded to distinguish a design, 3 (3.9%) had a main design on the exterior but the interior was too eroded to distinguish a design.

Rim/Lip Slip: 18 (23.7%) were red, 3 (3.9%) were black and 4 (5.3%) were black on the lip and red on the rim.

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Operation 31

North Zone

Form: There were 136 total pieces. 3 indeterminate, 92 (67%) were indeterminate open, and 2 (1.5%) were indeterminate closed. 16 (12%) were tripod plates, 18 (13%) were dishes or bowls with flared or outcurved sides, 4 (2.9%) were dishes or bowls with rounded sides and 1 (0.7%) was a cylinder vase.

Lip: 33 (24%) had rounded lips, 19 (14%) had beveled lips, 10 (7.4%) had square lips and 6 (4.4%) had pointed lips. The other 50% were either indeterminate or the lip was absent.

Rim: 59 (43%) had a direct rim, 6 (4.4%) had slightly flaring to flaring rims and 2 (1.5%) had everted rims. The other 51% was either missing the rim or was indeterminate.

Wall Type: 54 (40%) were outflared, 8 (5.9%) were outcurved, 6 (4.4%) were open and rounded, 2 (1.5%) had vertical walls and 8 (5.9%) were recurved. 62 (45%) were not applicable or were missing.

Special Body Sherd: 6 (4.4%) pieces had ridges, 5 (3.7%) had modified ridges that were not notched, and one (0.7%) had an angle.

Base: 47 (35%) had open, flat bases, 13 (9.6%) had open, flat bases with tripod feet, 3 (2.2%) had open convex bases, and one (0.7%) had an open rounded base with tripod feet. The other 72 either was missing the base or was indeterminate.

Foot Form: 13 (9.6%) had indeterminate feet and 3 (2.2%) had hollow, flat-bottomed, oven style feet.

Rim Diameter: There were 25 measurements for rim diameter. The mean rim diameter was 23.52 cm with a standard deviation of 6.57 cm.
Wall Thickness: There were 136 valid measurements for wall thickness. There was a mean of 0.79 cm with a standard deviation of 0.16 cm.

Vessel Height: There were 6 valid measurements for vessel height. One of 1.9 cm, one of 3.0 cm, one of 3.3 cm, 2 of 3.5 cm, and one of 4.3 cm.

Foot Height: There was one valid measurement for foot height: 3.3 cm.

Paste Color: There were few pieces with a croma larger than 6. There was nothing in the 2.5 YR.

- In 5YR, there were 13 (9.5%) pieces. 2 reddish yellow and 11 yellowish red.
  - 2 were in category B
- There were 75 (55.1%) pieces in 7.5 YR, the most common hue. There were 27 strong brown, 26 reddish yellow, 8 pink, 4 light brown, 7 brown and 3 between brown and dark brown.
12 were in category C

- There were 48 (35.3%) in 10YR. 13 were brownish yellow, 12 were yellowish brown, 8 were yellow, 4 were very pale brown, 1 was light gray, 4 were light yellowish brown, 1 was brown, 3 were between brown and dark brown and 1 was dark brown and one was dark yellowish brown.

12 were in category E

Paste Type: There were only three different paste types. 22 (16%) were fine grained tempered calcite, 29 (21%) were medium grained of a mixed volcanic and quartz medium and 85 (62%) were medium grained tempered volcanic ash.

Inclusions: 100 (73.5%) had ferruginous as inclusions, 19 (14%) had carbon, 16 (12%) had both ferruginous and carbon as inclusions. There was also one with Mica in it. In total 48% had cores.

Presence of a Core: 56 (41.2%) had a wide core, 10 (7.4%) had a narrow core, half of the interior was dark on one (0.7%) of them and half the exterior was dark on 3 (2.2%) of them.

Fireclouds: Fire clouds were present on 51 (37%) of the them. This percentage is high compared to the total percentage of fireclouding for the site which is 13%. Another 36 were indeterminate.

Underslip: 113 (83%) had white or cream underslips, and 4 (2.9%) were orange. 3 (2.2%) did not have underslips and 16 (11.8%) were indeterminate.

Background Slip: 117 (86%) had orange background slips, 10 (7.4%) had red slips and 3 (2.2%) had cream backgrounds.

Additional Slips: 41 (30.1%) had red slips, 10 (7.4%) had black slips, 61 (44.9%) had red and black slips, 1 (0.7%) had orange and black, 2 (1.5%) had red, black and other colors, and 3 (2.2%) and other colors.

Designs Present: 104 (76%) had no design or the piece was too eroded. 29 (21.3%) had a general geometric design and 3 (2.2%) had a simple geometric design.

Additional Decoration: 3 (2.2%) had fluting and one (0.7%) had negative or resist painting.

Location of Design: 8 (5.9%) had the design on the interior with no design on the exterior, 23 (16.9%) had the design on the exterior and no design on the interior, 2 (1.5%) had the main design on the interior with a secondary design on the exterior, 1 (0.7%) had the main design on the exterior and a secondary design on the interior and there were 2 (1.5%) that had a design on the exterior but the interior was too eroded to distinguish a design.

Rim/Lip Slip: 82 had no rim/lip slips. 42 (31%) were red, 10 (7.4%) were black and 2 (1.5%) were orange.
Operation 42

North Zone

Form Class: There were 75 pieces in Operation 42. 49 (65%) were dishes or bowls with flared or outcurved sides, 9 (12%) where dishes or bowls with rounded sides, 7 (9.3%) were cylinder vases and 7 (9.3%) were tripod plates. 3 were indeterminate.

Lip: 41 (55%) had rounded lips, 8 (10.7%) had square or flat lips, 2 (2.7%) had pointed lips and 2 (2.7%) had beveled lips.

Rim: 22 (29%) had direct rims, 26 (35%) had slightly flaring to flaring rims, 2 (2.7%) had interiorly thickened rims, 2 (2.7%) had slightly incurved rims that were exteriorly thickened and 1 (1.3%) had a slightly outflaring rim that was exteriorly thickened.

Wall Type: 23 (31%) were outflared, 6 (8.0%) were slightly outcurved, 21 (28%) were between outcurved and very outcurved, 3 (4.0%) had open rounded walls, 6 (8.0%) had incurved rounded walls, 7 (9.3%) had vertical walls, 1 (1.3%) had recurved walls and 2 were indeterminate.

Special Body Sherd: 1 (1.3%) had a ridge and 1 (1.3%) had an angle.

Base: 9 (12.0%) had open, flat bases and 4 (5.3%) had open, flat bases with tripod feet.

Foot Form: 3 (4.0%) had hollow, oven feet without the bottom of the feet. 1 was indeterminate.

Rim Diameter: There were 16 valid pieces of data for rim diameter. The mean was 24.2 cm with a standard deviation of 8.9 cm.

Wall Thickness: The mean wall thickness was 0.72 cm with a standard deviation of 0.14 cm.
Vessel Height: There were two valid entries for vessel height. One was 4.1 cm and the other was 5.0 cm.

Feet Height: There was one valid entry for feet height which was 3.3 cm.

Paste Color:

- In 2.5YR, there were 4 (5.3%) total. 2 light red and 2 red.
  - All 4 were in category A
- There were 28 (37.5%) in 5 YR. There were 18 reddish yellow, 9 yellowish red and 1 between yellowish red and reddish brown.
  - There were 18 in category B
- There were 31 (41.3%) in 7.5YR, the most common hue. There were 27 reddish yellow, 2 strong brown, 1 brown and 1 between reddish yellow and pink.
  - There were 17 in category C
- There were 10 (13.3%) 10YR. There were 3 yellow, 2 very pale brown, 2 brownish yellow, 1 between brownish yellow and light yellowish brown, and 2 between yellow and very pale brown.
  - There were 7 in category E

Paste Type:
<table>
<thead>
<tr>
<th>Paste Type</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
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<tr>
<td>calcite-tempered, medium</td>
<td>1</td>
<td>1.3</td>
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<tr>
<td>volcanic tempered ash, fine</td>
<td>22</td>
<td>29.3</td>
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<tr>
<td>tempered sand/quartz, fine</td>
<td>5</td>
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<tr>
<td>tempered sand/quartz, medium</td>
<td>9</td>
<td>12.0</td>
</tr>
<tr>
<td>mixed volcanic and quartz medium</td>
<td>10</td>
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<tr>
<td>volcanic ash-tempered, medium</td>
<td>26</td>
<td>34.7</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>73</strong></td>
<td><strong>100.0</strong></td>
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</tbody>
</table>

Inclusions: 47 (63%) had ferruginous, 5 (6.7%) had carbon and 6 (8.0%) had both ferruginous and carbon.

Presence of a Core: 13 (17%) had a narrow core, 13 (17%) had a wide core and half the exterior was dark on one piece. In total there were 34% with cores.

Fireclouds: 11 (15.1%) had fireclouds and 1 was indeterminate.

Underslip: 3 (4.0%) had white or cream undeslips and 1 (1.3%) had an orange underslip. All others (92%) had no underslip.

Background Slip: 26 (35%) had cream backgrounds, 11 (15%) had orange backgrounds and 3 (4.0%) had red backgrounds. 32 were indeterminate.

Additional Slips: 26 (35%) had red slips, 1 (1.3%) had a black slip, 7 (9.3%) had orange and red slips, 1 (1.3%) had orange and black slips, 23 (31%) had red and black slips, 8 (11%) had orange, red and black slips and 1 (1.3%) had red, black and other colored slips.

Designs Present: 3 (4.0%) had general geometric designs and 1 (1.3%) had simple geometric designs.

Location of Designs: 1 (1.3%) had the design on the interior and nothing on the exterior, 3 (4.0%) had the design on the exterior and nothing on the interior and 2 (2.7%) had a main design on the exterior with a secondary design on the interior.

Rim/Lip Slip: 24 (32%) were red, 5 (6.7%) were black, 4 (5.3%) had black on the lip and red on the rim and 1 (1.3%) was black and orange.
Notes on the Modal Analysis of Motul de San Jose Late to Terminal Classic Polychromes: Comparisons between the different operations of Motul de San Jose

By Antonia E. Foias

Morphological Attributes

1) General Form Class:

It seems that the larger groups have more closed polychromes, although these forms (jars, drums) are always a minority in comparison to the highly dominant open forms. Cylinder vases are also more common in the largest monumental groups than in the medium-rank and lower-rank or smallest groups.

2) Lips

The only difference appears to be between operation 2 in the Acropolis in Group C, and operation 15 in Group D: MSJ15 has more square lips than MSJ2 and fewer beveled lips than MSJ2. Only the Upper North Zone operations 35, 38, 42, 45 have a similar pattern to MSJ15. All other operations follow MSJ2 pattern of having beveled lips more common. Nevertheless, the most common lip type is rounded.

3) Rim diameter

Although the pattern is not without exceptions, it seems that the average size of polychromes is larger in the North Zone than in the monumental epicore. The Lower North Zone operations MSJ23, 26 and 39 have an average rim diameter of 22.7 cm, while the Upper North Zone operations MSJ 31, 35, 38, 42, 45 have a mean diameter of 23.6 cm. In comparison, Groups A and D have an average of 20.7 cm, Group C (MSJ2) of 20.0 cm, and MSJ17 in Group C of 19.7 cm. Operation 29 in Group B/E is slightly higher at 21.6 cm. The exceptions are operation MSJ33 in Group C, which has the higher mean of 22.6 cm, and the operations 19, 20, 30 in Groups B/C that also have the high mean of 24.2 cm.

4) Wall thickness

Paralleling and supporting the higher sizes of polychromes in the North Zone, wall thickness for the operations of the North Zone are also higher: Upper North Zone groups have an average thickness of 0.74 cm and the Lower North Zone of 0.78 cm. In contrast, Groups A and B have a mean thickness of 0.72, with Group D/MSJ15 and Group C/MSJ2 slightly higher at 0.73 cm. Operation 29 in Group B/E has thin vessels like the other monumental groups, with a mean of 0.69 cm.
Nevertheless, there are exceptions. MSJ17 in Group C, had the smallest rim diameter, but has relatively thicker walls with a mean of 0.76cm. Operation 33 in Group C had high rim diameters, but thin walls with a mean of 0.72 cm.

Operations 19, 20, 30 in Groups B/C also have thicker walls (mean 0.76cm) so these fit better the pattern of the North Zone groups.

**Technological Attributes**

There are some differences in the polychrome pastes between the monumental groups A, B, C, D and E in the core of the site and the smaller groups in the North Zone.

1) Paste Type:

One difference is in the abundance of pastes with calcite non-plastic inclusions. In the North Zone, these carbonate pastes are rare: Upper North (MSJ 31, 35, 38, 42, 45): 9.7% (MSJ31 by itself: 16%; MSJ 42 by itself: 1.3%). However, Lower North Zone (MSJ23, 26, 39) has significant carbonate pastes at 44.7%. Almost all of these come from MSJ23, with ops 26 and 39 basically lacking calcite inclusions. So, MSJ23 is the exception in the North Zone pattern, and fits better with the monumental groups.

In contrast, the central monumental groups tend to have carbonate pastes around 50%: Gr. A (MSJ8, 9, 10, 13, 16): 66%; Gr. B/E (MSJ 7, 11, 12, 14): 46.2%; Gr. B/C (MSJ 19, 20, 30): 31.9%; Gr. C (MSJ33): 30%. Gr. C (MSJ17): 78%; Gr. D (MSJ15): 49.3%; Gr. C (MSJ2): 63.2%. The overall average of all these operations is 52%. However, there is one exception in this pattern also: MSJ29 in Gr. B/E has a very low percentage of pastes with calcite inclusions (1.9%), much more similar to the pattern in the North Zone.

2) Paste Color

There are also differences in paste color between the North Zone and the monumental core. The North Zone polychrome pastes tend to have a more common darker red to red-brown variant, while the monumental core polychromes tend to be lighter in color. Here are the distributions across the hues in the Munsell Soil Color Chart:

North Zone (n=332): 2.5Y: 1 (0.3%); 2.5YR: 23 (7%); 5YR: 84 (25%); 7.5YR: 137 (41%); 10YR: 87 (26%)
Group A (n=99): 5YR: 25 (25%); 7.5YR: 46 (46.5%); 10YR: 28 (28%)
Group D (n= 449): 2.5Y: 2 (0.4%); 2.5YR: 18 (4%); 5YR: 86 (19%); 7.5YR: 224 (50%); 10YR: 119 (27%)
Group B (n= 147): 2.5Y: 1 (0.7%); 2.5YR: 8 (5.4%); 5YR: 18 (12%); 7.5YR: 73 (50%); 10YR: 47 (32%)

Group C (MSJ2) (n=1,222): 2.5Y: 8 (0.7%); 2.5YR: 8 (0.7%); 5YR: 113 (9%); 7.5YR: 629 (51.5%); 10YR: 464 (38%)

Group C (MSJ17, 33) (n=203): 2.5Y: 1 (0.5%); 2.5YR: 5 (2.5%); 5YR: 15 (7.5%); 7.5YR: 103 (51%); 10YR: 79 (39%).

The darker hues (2.5YR and 5YR) are more common in the North Zone (32%), while in the monumental center of the site, they vary from 23-25% in Groups A and D, to 17.4% in Group B, and to 10% in Group C. Elly Spensley (personal communication, 2009) has also found that the darker hue 5YR correlates chronologically with Tepeu 1 and the lighter hue 10YR with Tepeu 2 polychromes in the Motul de San Jose zone. She is conducting a petrographic analysis of the pottery of the Motul de San Jose zone for her Ph.D. dissertation in the Department of Archaeology, Boston University.

3) Core Presence

Although there are no clear distinctions across the site’s groups, it is surprising how common black cores are in the Motul de San Jose polychromes. Operations in the North Zone and in the core of the site reach above 40% in the presence of cores. Upper North Zone operations had 42%, and Lower North Zone operations had 39%. Operations 19, 20, and 30 in Groups B/C had 46%. Operations 17 and 33 in Group C reached 38% and 41%, respectively. Operation 2 in the Acropolis of Group C had 42%. The lowest frequency of black cores (19%) was in Group B (operations 7, 11, 12, 14), followed by Group A (27%), Group D and operation 29 (28%, both). The high incidence of cores suggests that firing was done at low temperatures or for shorter periods of time.

4) Fireclouding

Generally speaking, polychromes are protected through the use of saggars from fireclouding as such firing errors detract from the multicolored designs on them. In the Petexbatun region, polychromes had no fireclouding, in contrast with monochrome and unslipped pottery that frequently had such uneven coloring (Foias 1996). It comes, therefore, as a surprise that fireclouding is not rare at Motul, although highly variable across the landscape. Groups A and B had very rare clouds (5% and 0%, respectively). Operation 17 directly to the west of Group D also had no fireclouds. A frequency in the tenth percentiles is found in operations 33 (14%), 2 (12%), 15 (15%), and 19,20,30 (16%), and Lower North Zone (MSJ23, 26, 39) (10%). The highest incidence of black cores was found in the Upper North Zone (mostly from MSJ31) (28%) and in operation 29 (28%). Based on other evidence of polychrome production at Motul, it is possible that the high incidence in particular groups may relate with
polychrome production. We know that MSJ2 was the locale of a polychrome “workshop”, so it is surprising that the highest frequency of fireclouding is not in this operation.

Decoration Attributes

1) Underslip

The dominant underslip for all polychromes is cream in color. This serves as level and smooth layer for painting the actual designs. However, there were seven operations that had a small but significant amount of orange underslips, reaching from 8 to 16%: MSJ 15 and 29 had around 8%; Lower North Zone (MSJ23, 26, 39) and MSJ 2 had 12%; finally, MSJ 17 ranked the highest with 16%.

2) Background slip

When the background slip is considered, there are three frequent choices: orange (most common), red (less common), and cream (least common). Almost all operations had a majority with orange slip as the background. The exceptions are interesting: Group A had 46% with red background slips; operations 19, 20, 30 in Groups B/C had 38% with red background slips; operation 29 in Group B/E had 30% with red background slip; Lower North Zone groups (23, 26, 39) had 40% with red background slips; operation 17 in Group C had 41% with red background slip. Cream slip is generally a minority except in MSJ 2 (16%), MSJ 15 (11%) and Upper North Zone groups (MSJ31, 35, 38, 42, 45) (12%).

3) Designs present

The presence of design is clearly affected by preservation and the best preservation was found in MSJ2 and MSJ31 in the Upper North Zone. The type of design correlates with the socioeconomic rank of the residents of each group, and hence the monumental core should have significant more complex, figural and glyphic designs than the North Zone that includes no major architecture. Because of the preservation bias, MSJ2 and MSJ31 had the most designs preserved. MSJ15 also had a significant number of preserved designs. Nevertheless, MSJ31, a small group in the North Zone of the site, only had geometric designs with no glyphs or figural scenes. Operations 20 and 30 in Group B/E had 5 general geometric designs, 2 glyphic designs and 1 pseudoglyphic motif. Lower North Zone groups had 3 general geometric designs, and 1 figural and glyphic decoration. Operation 29 in Group B/E had 3 general geometric designs. Operation 33 in Group C had 1 general geometric design. All these groups are middle-rank status based on architectural volume. These are much smaller than the Acropolis in Group C and than Group D, excavated by operation 2 and 15 respectively. It is these subroyal and royal groups.
which show a wide range and much higher frequency of design motifs. MSJ2 had 220 general geometric designs, 7 with geometric and figural/naturalistic motifs, 25 with geometric and pseudoglyphs, 14 with geometric and glyphs, 7 general figures, 4 with humans or deities, 3 with humans and pseudoglyphs, 6 with humans and glyphs, 8 with general glyphic design, and 5 with general pseudoglyphs. MSJ15 had a similar broad repertoire of design motifs.