

SF Apparels Ltd. (10322)
SF Fashion Wears Ltd. (10324)
(Site also includes SF Washing Ltd.)

Nayabari, Kanchpur, Sonargaon

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Identified Priority 1 Concerns

None Identified.

Identified Priority 2 Concerns

None Identified.

Identified Priority 3 Concerns

Some missing elements in steel shed over dining space, required to complete lateral stability system. Same deficiency noted in some areas of the SF Washing Ltd. sheds.

Heavy water tanks at roof (4th floor) level. No distress was visible within, and columns have been checked, but further investigation into slab and beams may be pertinent.

Waterproofing layer at the concrete roof level, external to the 4th floor dining space, is not fully comprehensive across the floor area.

Identified Priority 3 Concerns Continued

Discrepancy between pile foundations suggested in Soil Report, and pad foundations on improved ground shown in As-Built drawings.

Factor of Safety around 1.86 from column load run-down.
'Green' rating, requiring only some further investigation.

1st Priority 3 Concern



This image is from the steel dining shed, forming a 4th floor level over the main concrete factory building below. As can be seen here, there is sufficient horizontal bracing, but no vertical bracing. As the perimeter walls are not in the same plane as the columns to provide stability, vertical bracing should be provided.

Note also that some secondary structural elements, such as bottom flange restraint, were also missing.

The same deficiencies noted here, for the 4th floor dining space over the main factory building, were also observed in the 'Extension Shed' of the SF Washing Ltd. buildings.

2nd Priority 3 Concern

Below are several large water tanks, located at the concrete roof level, outside the steel 4th floor level. Although no internal damage or distress was visible, a further check into the floor and column capacity is advised.



Above is the underside of the slab directly beneath the rooftop water tanks. The apparent 'joints' visible here are just the result of gaps in the formwork when placing concrete. No signs of distress were visible.

3rd Priority 3 Concern



Tiled portion of the concrete roof, providing a waterproof layer over the concrete deck.



This area, on the West side of the roof, is sloped for drainage, but does not have a waterproofing membrane.

This concrete roof area, surrounding the steel 4th floor level, appears well constructed, with a suitable slope and ample drainage routes. Most of the roof is also tiled for waterproofing, so it would seem sensible to complete this arrangement for the remainder of this currently unprotected level.

4th Priority 3 Concern

14. CONCLUSION –

In context of field and laboratory investigation the following conclusion may be drawn regarding the sub-soil formation of the project area.

- The over all soil formation of the investigated area are more or less regular among the bore holes location.
- The soil condition for Factory building is not suitable for shallow foundation.
- The bearing capacity for shallow foundation including strip, isolated footing & raft foundation are shown in the table.
- The allowable bearing capacity in ton per pile of R.C.C pre-cast pile are also shown in the table-12.

15. RECOMMENDATION:

According to our observation regarding the sub-soil condition as prevailing at the project area and the above discussion, the following recommendation may be drawn.

For the proposed structure R.C.C pre-cast pile of 12" dia of suitable length with proper pile cap may be provided. The allowable bearing capacity in ton per pile at different length below 5'-0" from E.G.L are shown below the table.

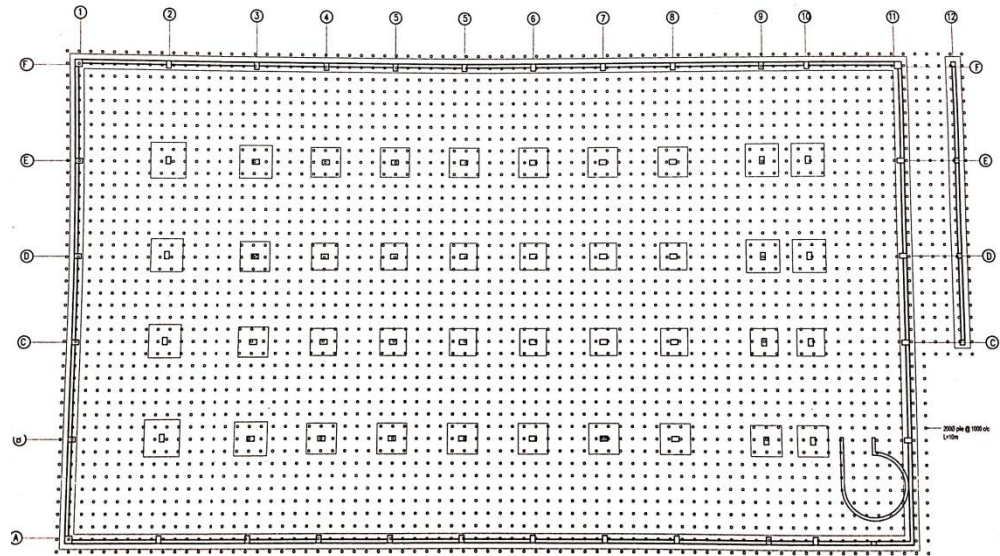
Length below 5'-0" from E.G.L	12" dia pre-cast pile		
	F.S. = 3.00	F.S. = 2.50	F.S. = 2.00
30'-0"	6.93	8.31	10.40
35'-0"	8.18	9.82	12.27
40'-0"	9.99	11.99	14.99
45'-0"	13.79	16.55	20.69

For the calculation of the allowable bearing capacity of pile the Structural engineer/ Foundation engineer may take help of table-12 where the allowable skin friction and end bearing are shown in ton per square feet.

These above bearing capacity may be confirmed by load test.

However, the structural engineer shall have to select the exact type, size and depth of foundation depending upon the various type of structure & structural loading pattern imposed on it.

[Signature]
01/10/62



SAND PILE LAYOUT

The extract from the Soil Test Report, shown to the left, clearly states a requirement for RC pile foundations.

Above is a structural As-Built drawing showing sand pile ground improvement and individual pad foundations.

There is no reason why this alternative solution should not work, however due to the deviation from Soil Report advice, it is requested that justification for the foundation solution is provided.

5th Priority 3 Concern



These images show the fairly regular column grid apparent across the building. For the column load run-down, the largest bay in the column grid was located and measured-up.

No significant concerns were raised through this calculation, however the resulting Factor of Safety was low enough to warrant a certain level of further investigation.



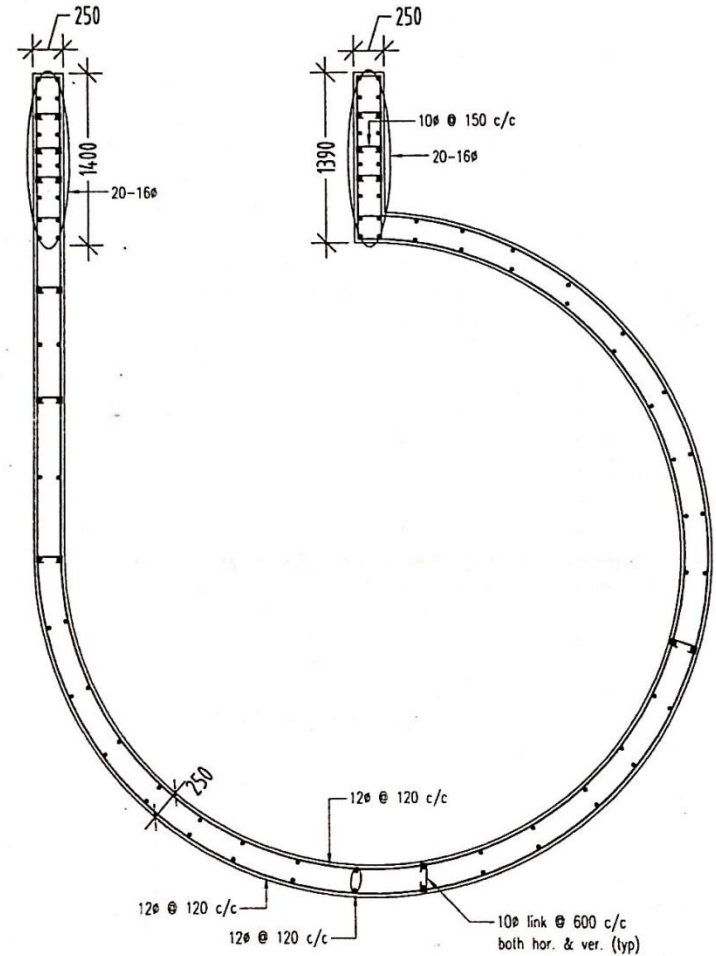
After Ferros scanning and measuring, it appeared that the columns had been constructed as shown in the drawings.

Overall Stability System



The concrete building had ample lateral stability, with both the reinforced concrete core shown to the right, and rigid beam-column connections throughout the structure.

As covered in the Priority Actions section, there were some minor issues with the stability of the various steel structures, shown briefly over the page.





Steel roof over the 4th floor dining space on the main building, as indicative of the other steel buildings on the site also. Ample horizontal bracing evident, but none in the vertical plane.

Water Ingress at Roof Level



Images showing the external roof space around the 4th floor dining area. Left; a tiled surface with apparently sufficient slope and drainage, as was observed across most of this roof level. Right; a small area of this roof level which had no waterproofing membrane, leaving exposed concrete/screed susceptible to water ingress.

As covered in the Priority Actions section of the report, provided there is a suitable slope on this roof, the simple addition of a waterproof membrane will be sufficient to prevent any future issues of water ingress.

Priority Actions

Problems Observed Summary

- ITEM 1: (Priority 3) Lateral stability system is thorough for most of the buildings, with some minor additions required to steel portions.**
- ITEM 2: (Priority 3) Heavy water tanks at roof level, requiring a capacity check of the supporting structure.**
- ITEM 3: (Priority 3) Waterproofing solution at concrete roof level is appropriate for most of the plan area, with only some small areas un-protected.**
- ITEM 4: (Priority 3) Foundation solution applied seems to differ from that suggested in Soil Test Report. Capacity to be confirmed.**
- ITEM 5: (Priority 3) Potential for over-stress in internal columns. Further investigation required.**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Priority 3 - Lateral stability system is thorough for most of the buildings, with some minor additions required to steel portions.	Cable cross-bracing to be extended down into the vertical plane (appropriate locations to be determined by Factory Engineer), for all steel structures lacking in this regard. Purlin stays to be installed to provide bottom flange restraint, to Factory Engineer's specifications.	6-months
2	Priority 3 - Heavy water tanks at roof level, requiring a capacity check of the supporting structure.	Factory Engineer to produce calculations confirming the capacity of structural elements (primary beams, secondary beams and slabs, as well as columns), under the loading of the rooftop water tanks.	6-months
3	Priority 3 - Waterproofing solution at concrete roof level is appropriate for most of the plan area, with only some small areas un-protected.	Waterproofing membrane to be applied to any exposed concrete areas of roof. Existence of sufficient roof slope and drainage routes to be confirmed.	6-months
4	Priority 3 - Foundation solution applied seems to differ from that suggested in Soil Test Report. Capacity to be confirmed.	Ground bearing capacity of improved ground, strengthened by sand piles, to be established (either by existing Soil Test or calculations, or new Site Investigation). Pressure exerted under installed pad foundations to be calculated following load run-down, and compared with bearing capacity established from previous point.	6-months
5	Priority 3 - Potential for over-stress in internal columns. Further investigation required.	Factory Engineer to review design, loads and column stresses for internal columns. Verify in-situ concrete stresses by 100mm dia. cores from 4 columns. Produce and actively manage a loading plan for all floor plates within the factory, giving consideration to floor capacity and column capacity.	6-months