Condition Assessment of constructed facilities in purview of Satara Police for maintenance planning

Rajendra N. Sapkal, Dhananjay S. Patil

Abstract— *It is widely accepted that good building condition assessment requires good planning. This Paper represents assessment of the condition of constructed facility in purview of Satara Police for maintenance planning. This include Asset inspection, condition assessment & prediction, short and long term planning & budgeting. In order to do the condition assessment, the case study for constructed facility needs to be carried out & information regarding that is presented in this paper. This paper shows all the old record maintenance data of Satara district Police Station building, then what is the present maintenance problem of the Police Station building was recorded. Then by using old maintenance data & present maintenance data given for the condition assessment of the building, all the building data was analyzed in details. Then calculated Facility Condition Index (FCI) in order to find out the condition of building & calculated Building Component Condition Index (BCCI) in order to find out the condition of component of building. So, by using FCI & BCCI prioritization of maintenance task can be easily done. This study is very useful to Satara Police, to plan the budget & prioritize the maintenance task.*

Index Terms— Condition Assessment, *Facility Condition Index (FCI), Building Component Condition Index (BCCI).*

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1 INTRODUCTION

Condition assessment is an important aspect for effective maintenance planning. With the help of this condition assessment one can check the present condition of building, remaining life of the building & the service, maintenance requirement of the building. This Condition Assessment paper represents current physical condition of the Satara District Police Station Building in current construction & also old construction. For the condition assessment, first all the old maintenance data of different Police Station building in Satara district was collected & registered in a checklist and collected current maintenance data with checklist & photographs.

A visual inspection of the Satara district Police Station was conducted to identify the condition and to estimate the cost to perform the necessary maintenance, repairs and renovations. The results of our assessment are summarized in the Facility Condition Index Table on Page 3. The estimated initial cost to repair these facilities totals Rs. 2400259. Based on FCI out of Seventeen buildings assessed, 4 building are in poor condition, 8 building in fair condition & 2 building in good condition. In these 4 buildings have FCI's in excess of 10%, two building have FCI between 15% and20%, the range in which a building should be considered

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for a major renovation and reconstruction. As FCI does not call for reconstruct of buildings, their BCCI computed can be used for prioritizing the available budget. More detailed discussion on the methodology and findings for each of the Police Station buildings is provided in the Existing Facility Assessment section in this paper.

2 Methodology

1. Collected the required old maintenance data of all Police Stations building in Satara district & also visited that Police Station collected maximum information about old maintenance record.

2. Selected the building for condition assessment. In these building 5 building with R.c.c. & 12 building with load bearing.

3. Visited to that Police Station & collected the present maintenance by using taken different photographs & filled checklist & discuss the concern person related to maintenance & collected all the present maintenance data from each building.

4. Visited to PWD office Satara for finding out maintenance period for the futures years & also prepared self timeline for the maintenance & budgetary planning by using old maintenance record analysis.

5. Then for the Facility condition index calculated present cost of each building & replacement cost for the similar building was calculated & FCI was calculated. For the

Building Component Condition Index calculated present cost of each component & replacement cost for the similar component was calculated & BCCI was calculated.

3 Condition assessment

Main objective of condition assessment are to place the building into one of the following three categories:

A. The building has not shown any signs of distress and it satisfies all the safety and serviceability requirements according to relevant Codes of practice, hence no action is needed towards retrofitting.

B. The building is seen to be deficient (or distressed) but it can be repaired and strengthened to satisfy the Codal safety requirements or performance criteria set by the user.

C.The building is badly damaged. It is to be demolished and a new building may be built, build back better.

Main steps of condition assessment will be

a) To record the damage if any, and find out the causes for distress.

b) To assess the extent of distress and to estimate the residual strengths of structural components and the system including the foundation.

c) To plan the rehabilitation and retrofitting/strengthening of the building.

3.1 Data collection:-

For the collection of asset record in Satara District Police station, collected the required old maintenance data of all Police Stations building in Satara district & also visited that Police Station collected maximum information about old maintenance record.

3.2 Condition assessment process
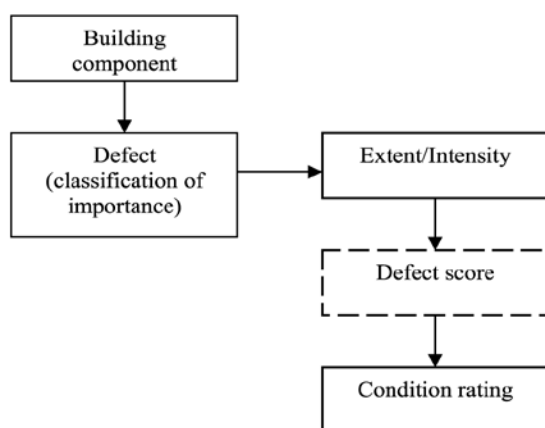
Source: NEN (2006)
Fig. 1 : Condition Assessment Process

The condition assessment process follows the pattern in Figure 1. The assessing of defects occurs first. Without this information one could not formulate maintenance activities and/or estimate costs. Subsequently

the inspector passes through the following condition parameters: importance of defects, intensity of defects and extent of defects. The extent and the intensity of a defect combined with the importance of the defect lead to a condition rating, probably with a defect score as an intermediary product.

3.3 Visited Police Station for condition assessment –

Visited Police Station for maintenance record collection & condition assessment are given below,

1)Vaduj   2) Rahimatpur 3) Aundh 4) Dahiwadi 5) Pusegaon 6) Koregaon 7)Satara city 8) Satara taluka 9) Karad city 10) Karad taluka 11) Umbraj 12) S.P. Office 13) Medha 14) Mahabaleshwar 15) Pachagani 16) Wai 17) Bhuinj.

3.4 Current maintenance data –

After collection of old data, new maintenance data was collected after visiting Police Station building in Satara District.

3.5 Maintenance periodicity –

For any type of building component, maintenance will be required after some period. So for that purpose I have collect list of items perennial repairs to building with their periodicity & task work from PWD office Satara. By using this list future maintenance planning can be done more effectively.

3.6 Data analysis for maintenance planning

All the collected information i.e. the historical data & collected data are used for find out the period when the maintenance should be done.

4 Facility Condition Index

The FCI table on page summarizes the results of the Existing Facilities Assessment. It provides the approximate age, size in sqft, excepted cost to construct a replacement building, and the estimated cost to repair the deficiencies found for each building. The estimated cost to repair all facilities total approximately Rs. 24,00,259/-. Dividing that by the estimated Rs.2,66,60,550/- cost of replacement for all facilities.

The generally accepted range of FCI's for establishing building condition is shown below. This standard has been adopted by the Building Owners and Managers Association, the Council on Education Facilities, and the American University Planners Association, and a number of other national facilities groups. This data is referred from Facility condition assessment report on coast community college district, presented on 28 February 2003.

Condition	FCI & BCCI
Good	0 to 5%
Fair	6 to 10%
Poor	10% & above

The facility condition index (FCI) is useful in comparing and prioritizing buildings of differing costs or sizes or types by showing the relative physical condition of the facilities. The FCI – stated as a percentage – measures the estimated cost of the current year deficiencies and compares it to the projected replacement cost of the facility. The total "Cost of Repairs" is divided by the current "Replacement Cost" for the facility, resulting in the "FCI". The higher the FCI, the poorer the relative condition of the facility.

For example, if a building has a replacement value of Rs.1,000,000/- and has Rs. 100,000/- of existing deficiencies, the FCI is 100,000/1,000,000 = 10%.

FACILITY CONDITION INDEX (FCI)

Sr. No.	Name of Building	Yr. Built	Gross sqft area	Repair cost	Replacement cost	FCI in %
1	Satara Tal. Police St.	2003	1310	188634	1375500	13.71
2	Vaduj Police St.	1962	1019	186423	1069950	17.42
3	Aundh Police St.	1972	1080	181782	1134000	16.03
4	Bhuinj Police St.	2000	1826	142726	1917300	7.44
5	M.shwar Police St.	1973	875	27450	918750	2.99
6	Wai Police St.	1932	914	75775	959700	7.90
7	Pachgani Police St.	1981	1168	75241	1226400	6.14
8	Koregaon Police St.	1931	846	87679	888300	9.87
9	Pusegaon Police St.	1962	1428	103898	1499400	6.93
10	Dahiadi Police St.	1967	896	67620	940800	7.19
11	Karad city Police St.	1979	2980	441271	3129000	14.10
12	Karad Tal. Police St.	1999	948	62190	995400	6.25
13	Umbraj Police St.	1972	1464	124502	1537200	8.10
14	Satara City Police St.	1913	1092	104861	1146600	9.15
15	Rahimatpur P.Stn	1971	1028	78409	1079400	7.26
16	S.P. Office	1913	4992	295258	5241600	5.63
17	Medha Police St.	2011	1525	28090	1601250	1.75
				2400259	26660550	

5 Result -

1) All the data of Police Station buildings in Satara District was collected. In these buildings 5 Police Station buildings with Rcc and 12 buildings with load bearing were selected & analyzed. In these building somewhere structural damages as well as superficial damages were observed.

2) The past data is collected from the past record of Police Station in Satara distrct from S.P. office.

3) From the past record collected the information of establishment of that Police Station & the life of that building.

4) From that record, got the idea of different types of maintenance of Police Station building at various places in Satara district. These maintenance are about steel rusting in slab, slab leakage, door decay, painting touchup, broken dado tile, plumbing & drainage leakages etc.

5) The data of the expenditure on the maintenance was collected year wise & it was analyzed for the condition assessment for the future budgetary planning.

6) During the visit to different Police Station buildings, got the clear idea of present maintenance & exact building condition. In that visit some Police Station building condition was found very poor, somewhere intermediate & somewhere good condition was observed.

7) Condition index on the collected data & the past data was analyzed according to the maintenance & demolition of the structure to the nearer of the end of the life of building.

6 Conclusion

This study of maintenance task to be performed & budgetary provision to be predicted can be summarized as follows,

1) The FCI (Facility Condition Index) derived for assessment are taken as follows, 0 to 5% - Good condition, 6 to 10%- Fair condition and 10% & above- Poor condition. (Reference- California community College FCI report, February 2003)

2) Based on FCI out of Seventeen buildings assessed, 4 building are in poor condition, 8 building in fair condition & 2 building in good condition.

3) Through FCI it is understood that these 4 buildings in poor condition needs to be given priority for maintenance, as there FCI is 10% and above.

4) As FCI does not call for reconstruct of buildings, their BCCI (Building Component Condition Index) computed can be used for prioritizing the available budget.

5) This study will be very useful to Satara Police, to plan their budget and prioritize the Maintenance tasks.

 6) In general also, people can use this data for budgetary planning.

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