

# Designing the school physical plant and facilities: An instructional material for Technical Drafting 10

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**Abstract:** The purpose of this study was to evaluate the physical plant status of the DepEd Toledo City Division in 2018 in order to suggest a development strategy. With the use of various statistical approaches, the researcher adopted a descriptive nominative approach. This is done to ascertain the conditions, practices, and scenarios that are typical of the research setting to find out what the superintendent of the Schools Division, the chiefs of the Curriculum Implementation Division, the School Governance and Operations Division, the Division Engineer, the Division Risk Reduction Management Project Development Officer, the section heads, the office staff, the school heads, and the teachers think about the various parts of the division's physical infrastructure. The first section, Plan A, contains the proposed five-year development plan for the physical plant and facilities of the DepEd Toledo City Division. This plan includes recommendations for improving the physical plant of the school and its facilities in order to accommodate the division's growing staff and to address any problems with those facilities that have been identified. The division's current maintenance program and practices are improved in the second part of Plan B, which is the presentation of an enhanced maintenance plan for the facilities of DepEd Toledo City. This will help to delay early deterioration of the division's facilities and structure. For technical drafting training, the proposed design orientation model of the physical plant and facilities can be used. Students studying technical drafting are permitted to utilize the design as a resource for their coursework.

**Keywords:** Technician Education, Technical Drafting, Drafting Instructional Material, 3-D Drawing

## *Introduction*

Drawing is the fundamental of all built structures. Even how simple the building is and even to the smallest furniture needs detailed drawing in order to have an accurate production. All physical plants come along with a drawing, nothing is built without a layout plan. The building itself, the partitions inside it, the car park, as well as the landscape that adds beauty to the entire site.

As stated in the official gazette in the Republic of the Philippines which affirms the K-12 Law, Republic Act No. 10533. Therein, secondary education was referred to

the third stage of obligatory basic education. It is composed of at least four (4) years of junior high school education and two (2) years of senior high school education. The Department made sure that all students who will graduate are ready to pursue for college education. Students must be prepared according their chosen field of specialization. DepED in coordination with CHED and the Technical Education and Skills Development Authority (TESDA) ensured it.

One of the components in Information and Communications Technology is Technical Drafting. Students who are tech savvy chose ICT because it is easier for them to follow the course. Technical Drafting being one of the picks for those who are artistic in nature and at the same time computer wizard. As part of the instruction in Technical Drafting, it considers the fundamentals of drawing. In this method, the use of lines and symbols in drawing are utilized.

Furthermore, to get hold of the office facilities, as environments having specific influence on the process of assisting personnel of Department of Education Toledo City Division Office, experiences and comfort, to serving non-teaching and teaching personnel is vital. These physical facilities should be built according to standards, serve and provide the venue in which ample space and traffic pattern occurs, as delivered.

Toledo City is in the island of Cebu province, and within Region VII-Central Visayas. Department of Education Toledo City Division became a Division in 1963. Prior to that, Toledo City was part of the Division of Cebu Province and up to this date, its Office occupies one of the buildings of the South City Central School for the School Governance and Operations Division and one new building for the Administrative Offices and Curriculum Implementation Division located at D. Macapagal Highway, Poblacion, Toledo City.

It is observed that the existing office is too small as compared to the growing number of employees based in Rationalization Plan. Meanwhile, having maintenance on office facilities as a second priority is a short term means of saving money. While this seems to be a very practical tool for immediate savings, the apparent deterioration in the condition of an improperly maintained building is a very obvious and often begins within a matter of a few months.

#### *Review of related literature*

According to PSU Site, the importance and value of a school physical plant is that with respect to improving the quality of facilities is an expensive task. However, if positive impacts of facility improvement on teachers and personnel are considered, the rewards of such investments far exceed the cost of the investments. These are the five primary features of school facilities: acoustics/noise, air quality, lighting, temperature, and space.

This research will provide localized instructional materials for technical drafting students and teachers. This is to provide our students have a grasp of resources from our very own locality.

A good office layout is the best thing every worker desires. Work ambiance is more important than anything else. Layouting an office which is comfortable to stay for the whole day is significant. Traffic pattern is considered also in doing so.

Looking at the drawing, it comprises circles and other geometrical figures that were used by the draftsman to form a layout for an ideal workplace. For the ellipses, here's how it is made.

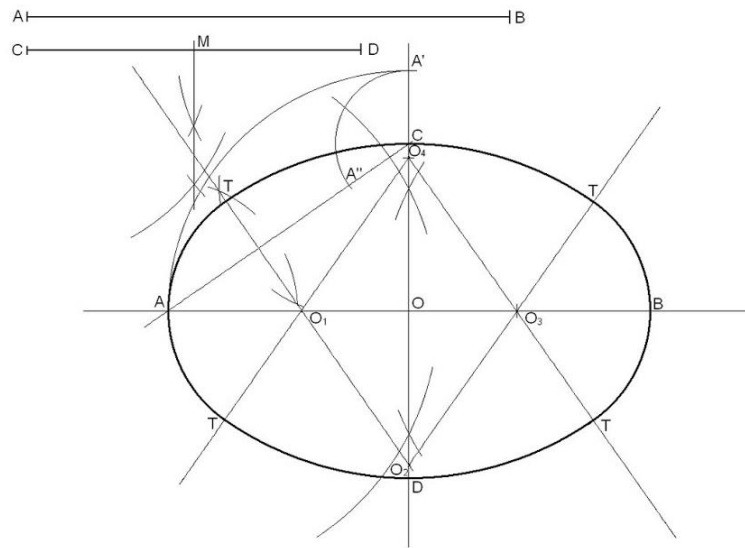


Figure 2

References: A-B, C-D

1. Draw 4 inclined lines following the references.
2. Using a compass draw an arc pointing the needle to intersection D while striking an arc with the pencil from T to T.
3. Using a compass draw an arc pointing the needle to intersection C while striking an arc with the pencil from T to T at the bottom part of the drawing.
4. From intersection O1, draw an arc connecting T to T on the left side. From intersection O2, draw an arc connecting T to T on the right side.

There are many physical plant and research outputs on the theoretical background of offices today in which work flow are sometimes affected by the design and size of their office. There is a myriad of factors that can affect the working behavior of personnel. Such factors can either be external or internal. External because the environment plays a great role in getting the best or the worst from a personnel and internal because although a working environment is considerably helpful in making him perform his best, there maybe things within the worker that hinder him from doing so.

This investigation tries to discover methods for accomplishing adequacy and productivity in the process of serving clients by discovering means to enhance the current physical plant of DepEd Toledo City Division to accommodate with necessities as the main DepEd office in Toledo City. This study was closely related to the works of some researchers that follow:

**Constructing New Facilities.** During strategic long-range educational planning, unmet facility space needs often emerge. The goal of educational planning is to develop, clarify, or review the educational mission, vision, philosophy, curriculum and instructional delivery. Educational planning may involve a variety of school and community workshops and surveys to identify and clarify needs and sharpen the vision of the district. Long-range planning activities, such as demographic studies, financing options, site acquisitions, and community partnering opportunities are often initiated by the district administrations, and community partnering opportunities are often initiated by the district administration as a response to the results of educational planning. An outcome of long-range planning is the development of a comprehensive capital improvement program to address unmet facility needs.

Given the high cost of constructing new buildings, this approach may be inappropriate in the long run. Such improvements can be planned according to the need. Prioritizing areas that are practical also to the budget of DepEd basic education facilities fund.

**Physical Plant and Facilities.** The main office site should be located in a wholesome environment, safe from traffic and transportation hazards, sufficiently free from noise, dust, smoke, and other undesirable elements. Adequate facilities should be provided especially for drainage and sewage disposal.

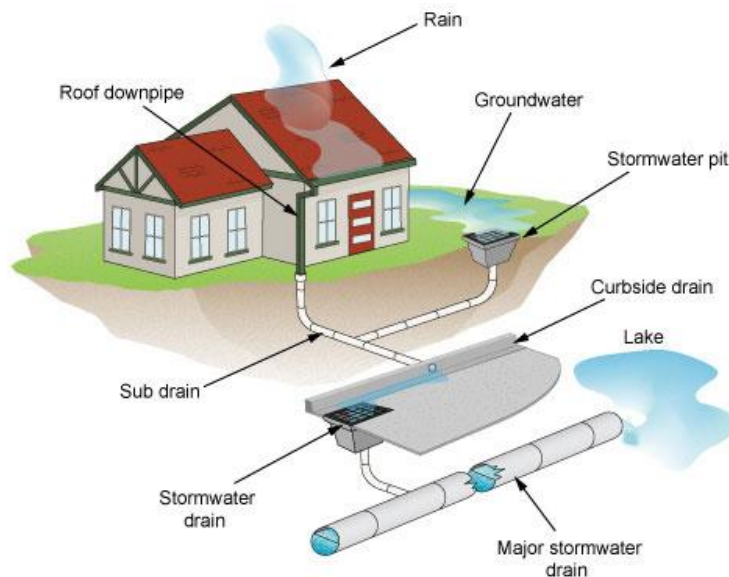
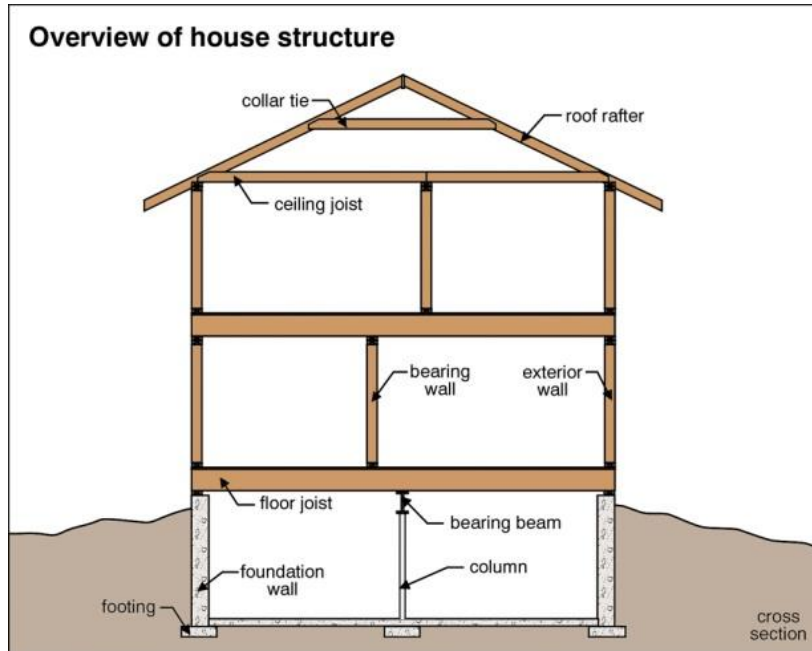


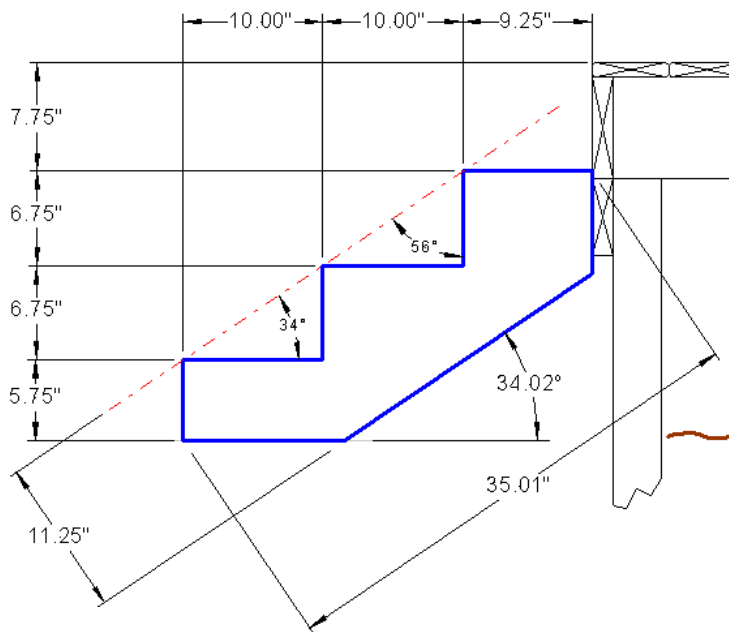
Figure 3

According to [tippingsplumbing.com.au](http://tippingsplumbing.com.au), it is very significant that this system is maintained frequently and operational all the days otherwise it may cause blockages

or flooding and many other horrific incidents. As shown in figure 2, the sewer drainage system is specifically designed for transporting sewerage and waste from sinks, bathrooms, sinks and other works in the office or home buildings through pipes to throwing away areas.



The buildings should be functionally designed and constructed of strong and durable materials to withstand earthquakes, typhoons, and fire. Their design should be pleasing to the eye and in conformity with the surroundings, and at the same time, imbued with proper atmosphere conducive to working and learning. They should be satisfactorily planned so as to meet the future expansion needs.



Layout Cuts On 2x12 Material

Figure 5

According to [citiesinspection.com](http://citiesinspection.com), approximately 90% of all structural building fall down are caused by moisture. In spite of age, style, or location; moisture is tremendously damaging and it must be recognized by all homeowners and building owners to be able to recognize it. It's important to understand what really the structure. These are the four parts to the buildings 'super' structure and they are the foundation, floors, walls and roof.

Figure 5 shows the standard and safe dimensions of a staircase as figured out by [hammerzone.com](http://hammerzone.com). Stairways and fire exits should be adequate and standard in size and number and conveniently located.

As per idea expressed by [glamox.com](http://glamox.com) of UK, safe, functional and friendly – the most favourable lighting solution will be experienced in these areas a welcoming feeling must be experienced. The safety of stairways is a significant priority in order to eliminate possible accidents and hazardous situations on stairs. There should be no obstruction in corridors that would impede the free flow of movement. Aside from having this convenience, there should be a well planned entrance and exit points to ensure safe and convenient mobility of the school population.

### *Methodology*

#### *Design*

In this design, the descriptive nominative method with the aid of some statistical method and techniques were used. This is to determine the norms and standards, or typical condition or practice, and situations prevailing the research environment (2000, p. 53) Since this method establishes standards of what is prevalent (Seville, et al. 2005), it is suitable in order to comprehensively investigate the relationship between the present condition of schools division of Toledo City physical plant and the need for its development for the utilization and functionality. A research-made questionnaire patterned from the previous questionnaires employed by other researchers in their previous studies, was used as the main instrument in the data collection. This questionnaire was validated by conducting a dry run among the teachers, administrative staff and personnel who were not considered respondents of the study.

#### *Environment*

This study was limited within Department of Education Toledo City Division. The site is located at D. Macapagal Highway, Toledo City. It is one kilometer away from City proper and considered accessible to all schools since it is in heart of the city. There are two buildings that are functional in the division but still not enough for the growing population. One of the buildings is an old Gabaldon Building built in the year. The building is divided into two sections of the office namely; Curriculum Implementation Division and Schools Governance and Operations Division. The other building is a two-storey building where superintendent's office is situated; the



administrative offices are also joined here. There are spaces for car park inside the vicinity for some officials and clients who are coming to the office. The space for the division office was only borrowed from South City Central School, an area beside the elementary school just beside the office.

### *Instruments*

The instrument used in gathering data was adapted from Uy, Bernardo, 2009 Research with the aid of observation in order to come up with a proposed development plan for Department of Education Toledo City Division. Hence, the instructional material used by the students in Technical Drafting Grade as reference in laying out buildings, doors, and windows.

The following were the research instruments used in gathering data:

1. Questionnaire. The adapted research made questionnaire will be the main tool to collect data. It has different parts namely: Part I, Profile of the Respondents; and Part II, The Evaluation on the present condition/ status of Schools Division of Toledo City physical plant and facilities.

2. Informal Interview. A method which will also use to supplement the result or information obtained from the questionnaire.

3. Observations and Inspections. This will be done to actually appraise and evaluate and extent of development to be proposed. This will be used by the students in their Technical Drafting projects.

For the research questionnaire, the Likert Scale used in answering the questions asked.

Below are scales with their corresponding meaning.

5 Excellent *When the provisions of conditions are extensive, functioning excellently, and of high quality cases.*

4 Very Good *When the provisions or conditions are extensive, functioning very well, and of above average degree of quality in all cases.*

3 Good *When the provisions or conditions are limited in extent but functioning very well, and is of an average degree of quality in some cases.*

2 Poor *When the provisions or conditions are limited although there seems to be a need for them, and that the indicator is of below and average degree of quality in some cases.*

1 Missing *When the provisions are missing although there seems to be a need for them, and that the indicator is of below average degree of quality in some cases*

To determine the effectiveness of the existing maintenance program and the extent of need for the provisions mentioned in the questionnaire, the following scales will be used with their corresponding meaning and value:

3 Highly Effective (HE)/ *When the existing maintenance program,*

Highly Needed (HN) policies, and implementation is very effective; the need for the provisions is extremely high or is very important.

2 Effective (E)/ When the existing maintenance program,

Needed (N) policies, and implementation is satisfactorily effective; the need for the provisions is high.

1 Not Effective (NE)/ When the existing maintenance program,

Not Needed (NN) policies, and implementation is not effective; there is no need for the provisions.

*Procedures of data gathering*

The following procedures were used in the gathering of data:

Preliminary Preparation. A letter request asking permission to administer the questionnaire to the selected personnel in DepEd Toledo City Division, was prepared and was addressed to the superintendent, with the recommendation of the chief of Curriculum Implementation Division.

Administration of the Questionnaire. The administration of the instrument was conducted through random sampling of the respondents.

*Treatment of data*

After the questionnaire was administered, the frequency of the responses was tallied, collated and tabulated and subjected to the given statistical procedures and analysis.

To determine the perceptions of the Schools Division Superintendent, Curriculum Implementation Division Chief, School Governance and Operations Division Chief, Division Engineer, Division Risk Reduction Management Project Development Officer, Section Heads, Office Personnel, School Heads, and Teachers on the various components of the physical plant of the division.

**SCORING PROCEDURE**

To interpret the data gathered, the following parametric scale used:

Lower Limit	Upper Limit	Category	Verbal Description
4.21	- 5.00	- Excellent (EX)	When the provisions or conditions are extensive, functioning excellently, and of high quality cases.
3.41	- 4.20	- Very Good (VG)	When the provisions or conditions are extensive, functioning very well, and of above average degree of quality in all cases.
2.60	- 3.40	- Good (G)	When the provisions or conditions are limited in extent but functioning very well, and is of an average degree of quality in some cases.
1.81	- 2.60	- Poor (P)	When the provisions or conditions are limited although there seems to be a need for them, and that the indicator is of below and average degree of quality in some cases.



1.0 - 1.80 - Missing (M) When the provisions are missing although there seems to be a need for them, and that the indicator is of below average degree of quality in some cases.

*Result and discussion*

The status of DepEd Toledo City Division physical plant is being presented in tables 5 - 22. For reliability of responses, Table 2 displays the profile of the respondents as to their age and gender, while Tables 3 and 4, respectively, show the profile of the students as to the number of years in the school; and faculty as the number of years working in DepEd Toledo City Division.

**Buildings and Site**

This section presents the respondents’ assessment on the present condition of Deped Toledo City Division buildings and site.

**Site Development**

As revealed in Table No. 5, all of the criteria presented, with respect to the status of DepEd Toledo City physical plant and facilities as to its site development program/plan, were perceived useful, except for solid waste management, which was observed and classified not useful with a weighted mean of 1.68. As observed there was only 1 set of garbage cans only located at the entrance of the office near the guard house.

**Status of DepEd Toledo City Division Building and Site**

**As to its Site Development Program/Plan**

Table 2

**Buildings and Site**

		3	2	1	
A. BUILDING AND SITE		Very Useful	Useful	Not Useful	
1	Site Development				2
1.1	Site Provisions for growing employee population and future expansion	15	7		2.68
1.2	Site Provisions for functions, gatherings and other special occasions	8	5	9	1.95
1.3	Covered Walks/Footpaths/Walkways	7	6	9	1.91
1.4	Site Drainage System	6	8	8	1.91
1.5	Site Lighting System	10	12		2.45
1.6	Area of outdoor educational activities(Social, physical, athletic, cultural and Religious)	1	11	10	1.59
1.7	Site Development Plan (showing present status and future improvements/provisions	5	10	7	1.91
1.8	Solid Waste Management	5	5	12	1.68

The Table shows that the highest weighted mean for site development is item 1.1 - Site Provisions for growing employee population and future expansion. This means that respondents found out that this item is very useful. On the other hand, the lowest is item 1.6 - Area of outdoor educational activities(Social, physical, athletic,

cultural and Religious). This also means that this item is useful but needs improvement.



Figure 15. Existing



Figure 16. Proposed Plan

The table shows the status of DepEd Toledo City Division physical plant as to its site landscaping and amenities.

Table 3

Site landscaping

Site Landscaping							1.7
2	.	1	Landscaping Design	3	12	7	1.82
2	.	2	Drainage facilities and sewerage	5	8	4	1.59
2	.	3	Width of walkways for two people walking abreast	7	7	8	1.95
2	.	4	Distribution of benches in the area where teachers can rest	2	7	13	1.5
2	.	5	Number of parking lots	3	12	7	1.82
2	.	6	Layout of parking spaces		12	10	1.55
2	.	7	Flow of vehicles inside the site		9	13	1.41
2	.	8	Traffic signs for safety	7	5	10	1.86
2	.	9	Trimming of plants	5	12	5	2

As shown in table 3 and as perceived by the respondents, a good landscaping design is not regarded as very useful, but is averagely needed in the division. Having

manifested a weighted mean of 2.0, the trimming of plants”, was perceived by the respondents to be useful. The other area which under site landscaping that received a poor perception or lowest weighted mean in the “flow of vehicle inside the site”, 1.41; distribution of benches in the area where teachers can rest, 1.5; layout of parking spaces, 1.55; traffic signs for safety, 1.86. All of these areas were regarded by the respondents to be not useful.

The other areas in site landscaping and amenities, as to DepEd Toledo City Division site which were rated useful based on their weighted means are as follows: “landscaping design, 1.82; number of parking lots, 1.82; width of walkways for two people walking abreast.

The physical plant of DepEd Toledo City Division as to its site landscaping was rated as useful, which means the availability of landscape, useful as average according to availability of landscape, and not useful for not observed in the landscape.



Figure 17. Existing



Figure 18. Proposed Plan



Figure 19. Existing



Figure 20. Development Plan

Presented in the table is the status of physical plant as to DepEd Toledo City Division facilities layout and location.

Table 4

Facilities Layout/Location

Facilities Layout/Location								1.8	
3	.	1	Ventilation and illumination between buildings	5	13	4	2.05	22	
3	.	2	Covered walks for easy access between buildings	2	7	13	1.5	22	
3	.	3	Walkways/footpaths for access to other buildings and areas	1	11	10	1.59	22	
3	.	4	Prevention for direct entry of sunlight to buildings	2	15	4	1.82	21	
3	.	5	Buildings windows exposure to direction of prevailing breeze	2	15	4	1.82	21	
3	.	6	Grouping together of buildings serving the same functions/purpose	3	12	7	1.82	22	
3	.	7	Layout of facilities for direct human movement and accessibility	5	12	5	2	22	

As shown and perceived by the respondents, covered walks for easy access between buildings is not regarded as very useful. Having manifested a weighted mean of 1.59; the walkways/footpaths for access to another buildings and areas was perceived by the respondents to be useful but needs improvement. The other areas of under the site facilities layout/location such as: ;preventions for direct entry of



sunlight to buildings and building windows exposure to direction of prevailing breeze both have weighted mean of 1.82, were considered useful. While grouping together of buildings serving the same function/purpose, 1.82; layout of facilities for direct human movement and accessibility, 1.2; and ventilation and illumination between buildings, 2.05, were classified as useful but also needs slight improvement.



Figure 21. Existing



Figure 22. Development Plan

In the overall, the facilities layout and location of DepEd Toledo City Division was rated good and identified as useful according to its weighted mean. The findings imply that covered walks for easy access between buildings and to provide walkways/footpaths for access between buildings and areas area needed.

As to the aesthetics of DepEd Toledo City City Division physical plant, the respondents rated each criteria as good, with the ratings on the following: color combination used in buildings, 2.23; building designs, 2.45; building materials used, 2.45; both were rated useful as presented in table 9.

Areas of development and improvement were seen to be averagely useful, as to the extent of this need, while the combinations used in buildings are considered by the respondents to be useful while building designs and building materials used both were rated by the respondents equally with a weighted mean of 2.45.

Table 5

Aesthetics

Aesthetics					2.4	
5	1	Color combination used in buildings	8	11	3	2.23
5	2	Building designs	12	8	2	2.45
5	3	Building materials used(for texture, surface treatment, etc.)	12	8	2	2.45

Table 10 which indicates the present status of the physical plant of the division as to its buildings revealed that the following areas were considered not useful in their present situations and which improvements and revision were regarded as not useful in the divisions as evidenced by their weighted means: covered walks/bridges, 1.45; garbage bins/cans, 1.77; accessibility of administrative offices to reasons with disability, 1.82; ramps for persons with disability, 2.05.

All of the other areas and criteria were all rated useful or shown in the aforementioned table with the present condition of the divisions buildings the respondents see them to be fully functioning except for some minor problems.

Covered walks as considered as the main concerns as noticed in this section where respondents made responses.

*Conclusion*

The breakdowns of the results, as to its building and site, were as follows: building and site, were as follows: the site development, good and regarded as useful; site landscaping, good and regarded as useful; facilities layout/location, good and regarded as useful; environment, good and regarded as useful; aesthetics, good and regarded as very useful; buildings, good and regarded as very useful.

In the administrative and services were considered good and useful, in general it has the following breakdowns and results: administrative office, good and regarded as very useful; medical and dental clinic, good and regarded as useful; building services, good and regarded as very useful.

The status of the non-programmed spaces got an overall assessment of good and regarded as very useful, in general it has the following breakdowns and results: public common toilets, good and regarded as very useful; hallways and corridors, good and regarded as very useful; disaster preparedness programs, good and regarded as very useful; perimeter fence and gates, good and good and regarded as useful.

In Section II, the status of civil/sanitary section was good and regarded as useful.

Based on the findings, there is a need to improve some of the facilities in DepEd Toledo City Division as reflected by the evaluation, where majority of the areas were considered to be limited in extent, although functioning well, are only of the average degree of quality in most cases.

On the other hand, the implementation of the maintenance programs, policies and practices needs to be enhanced and strictly implemented.



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