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### Locker and Shower Room Facilities Used for Physical Education at South Dakota State College

Peter Dominic Torino

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LOCKER AND SHOWER ROOM FACILITIES  
USED FOR PHYSICAL EDUCATION AT  
SOUTH DAKOTA STATE COLLEGE

By

Peter Dominic Torino

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A problem submitted  
in partial fulfillment of the requirements for the  
degree Master of ~~Science~~ at South Dakota  
State College of Agriculture  
and Mechanic Arts

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LOCKER AND SHOWER ROOM FACILITIES USED FOR  
PHYSICAL EDUCATION AT SOUTH DAKOTA STATE COLLEGE

CHAPTER I

INTRODUCTION

This is a study of the existing locker and shower room facilities for physical education at South Dakota State College. At present, there is little or no information covering this topic, and at the same time there is a possibility that such information could be most useful and important.

South Dakota State College at present requires at least one year of physical education for all students. With the present load and the predicted increased enrollment, will the facilities be able to handle the increase, and are they now adequate to handle their present load?

### Statement of the Problem

It is the purpose of this study to compare the physical education locker and shower room facilities at South Dakota State College with those recommended by learned individuals and organizations in the fields of physical education and school construction.

## CHAPTER II

### REVIEW OF LITERATURE

This chapter is composed of information acquired from several authoritative sources on the subject of locker room and shower room facilities for physical education. This material will be used as a set of standards to compare with the locker and shower room facilities at South Dakota State College, in order to form a picture with regard to the existing conditions.

#### A. THE LOCKER ROOM

At the National Facilities Conference<sup>1</sup> it was stated that a dressing locker room suite should be provided in every school. Such facilities are needed for participants in physical education, athletics and recreation programs for hygienic care of themselves and their clothes for activity and street wear. This suite includes dressing space, lockers, showers, towel room, toilets, lavatories, towel service and storage room.

According to the National Athletic Institute<sup>2</sup> the cen-

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1. A Guide For Planning Facilities For Athletics, Recreation, Physical And Health Education, pp. 57.

2. Planning Facilities For Health, Physical Education and Recreation, p. 64.

tral dressing room or locker room should be located so as to serve functionally the indoor and outdoor teaching stations and other service facilities related to dressing room use. Dressing rooms should be located on the gymnasium floor level directly adjacent to and connected with the gymnasium. Other teaching stations should be located as closely as possible to the dressing rooms. Access from dressing rooms to each physical education teaching stations should not be through public corridors. Dressing rooms should also be located and designed so that persons outside cannot see into them. Dressing rooms should be directly accessible to shower rooms. Participants of the National Athletic Institute<sup>3</sup> stated that the locker room should be on the same floor with the gymnasium and adjacent to it. It should be possible for students to enter the locker room directly from outside playing fields or from the corridors without crossing the gymnasium floor. The location of the main locker room should be immediately adjacent to the supply room. Brownell<sup>4</sup> stated that the locker room and shower room should not be placed in the basement.

The locker room according to Hughes<sup>5</sup> should be square or nearly square. Factors which influence the shape and size

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3. Planning Facilities For Health, Physical Education and Recreation, loc. cit.

4. Administrative Problems in Health Education, Physical Education, Recreation, p. 84.

5. William Leonard Hughes, Administration of Health and Physical Education in Colleges, p. 296.

of dressing rooms according to the members of the National Athletic Institute<sup>6</sup> are spaces required for benches, lockers, storage, toilets, showers, circulation of pupils and towel-  
ing room. If group-type dressing accommodations for girls are desired, it was suggested these units be designed for eight to twelve girls. Sufficient group-type units will be necessary to accommodate the peak period load. Brownell<sup>7</sup> also stated that the size of the locker room depends in addition to peak load usage upon the type of costume control utilized; individual lockers, locker-basket or dressing locker storage lockers. He added ease of administration indicates one main dressing room for each sex, plus smaller dressing rooms for special purposes (athletic teams, community use, faculty, etc.) Vannier and Fait<sup>8</sup> stated that the locker room should be large enough to accommodate each class and contain an average of 4 square feet per student at peak load. In disagreement with this the National Facilities Conference participants<sup>9</sup> stated that locker rooms should be large enough to provide an average of fourteen square feet per pupil

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6. Ibid.

7. Administrative Problems in Health Education, Physical Education, Recreation, loc. cit.

8. MaryHelen Vannier and Hollis F. Fait, Teaching Physical Education in Secondary Schools, o. 90.

9. A Guide For Planning Facilities For Athletics, Recreation, Physical Education and Health Education, p. 61.

in the peak period load exclusive of space required for lockers.

Hughes<sup>10</sup> believed that locker rooms should have a ceiling height of at least 10½ feet.

Friswold,<sup>11</sup> in discussing ventilation, concluded that mechanical ventilation of the exhaust type would remove odors from the locker room and prevent condensation of moisture.

Bartholomew<sup>12</sup> agreed with this and also recommended that mechanical ventilation should be installed so as to avoid drafts.

Hughes<sup>13</sup> said of ventilation that it should be accomplished by mechanical means or by window-gravity method (in rooms having 100 occupants or less). The participants of the National Facilities Conference<sup>14</sup> recommended controlled ventilation for rapid removal of excess heat and moisture and that this may be provided in conjunction with the shower room ventilation system.

Lighting, according to the participants of the National

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10. Hughes, op. cit., p. 295.

11. I.O. Friswold, "Locker and Shower Facilities," American School Board Journal, 100, (January, 1940) p. 55.

12. C. Bartholomew, "Standards for Locker and Shower Rooms," Journal of Health and Physical Education, 12, (January, 1941) pp. 29-31.

13. Hughes, op. cit., p. 295.

14. A Guide For Planning Facilities For Athletics, Recreation. Physical and Health Education, p. 61.

VENTILATION

Facilities Conference,<sup>15</sup> is very important especially for damp rooms such as the dressing-locker suite. They felt as did other authors that these rooms should be oriented so as to receive an abundance of direct sunlight, preferably from the south. Their opinion was also expressed by a number of authorities on the amount of artificial light necessary in the locker room. They suggested that 10-15 foot candles, four feet above the floor, be used. Members of the Athletic Institute<sup>16</sup> stated that the dressing and locker rooms should be well lighted. The layout of lockers should be considered when planning electric fixture arrangements. Moisture proof light fixtures should be installed. Wall outlets should be placed a minimum of three feet above the floor. Hughes<sup>17</sup> recorded that studies indicate a preference for a diffused type rather than direct lighting. Shadows should be avoided. Ceiling lights should be reflectors and be so placed that they can be reached without a scaffold.

Regarding the recommended temperature for the locker room, the various authorities differed to quite an extent;

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15. Ibid.

16. Planning Facilities For Health, Physical Education and Recreation, p. 65.

17. Hughes, op. cit., p. 295.

however, the National Facilities Conference<sup>18</sup> participants and the College Physical Education Association<sup>19</sup> agreed that the air room temperature should be 80°-85° F., at a level 4 feet above the floor.

The majority of authorities consulted in this study, agreed on radiated heat in the locker room. The National Athletic Institute<sup>20</sup> members stated that radiant heating is recommended because of its value for dry floors, foot comfort, and elimination of drafts. In colder regions it may be necessary to add supplementary heating. In disagreement with this Hughes<sup>21</sup> believed steam heating is preferable. Forced and recirculated hot air is sometimes used. Some individuals recommended recirculated washed-air. Voltmer and Esslinger<sup>22</sup> felt that radiators should be recessed in the walls or placed above the heights of pupils. If recessed, a few protecting bars or grates should be used. It is probably best to suspend them from the cei-

18. A Guide For Planning Facilities For Athletics, Recreation, Physical and Health Education, p. 111.

19. College Facilities For Physical Education, Health Education, and Recreation, p. 113.

20. Planning Facilities For Health, Physical Education and Recreation, p. 65.

21. Hughes, op. cit., p. 295.

22. Edward F. Voltmer and Arthur A. Esslinger, The Organization and Administration of Physical Education, p. 174.



ling in the locker room. The College Physical Education Association<sup>23</sup> also recommended that heating radiators should be brass, chromium plated iron, or other material suitable for a moisture-laden atmosphere.

The College Physical Education Association<sup>24</sup> set up the following rating scale for suggested surfaces in the locker room: (3--good, 2--better, 1--best). Ratings were listed as follows:

Locker room floor

- 1--ceramic tile
- 2--abrasive terrazzo (marble)
- 3--abrasive concrete, non-absorbent

Locker room walls

- 1--glazed brick or ceramic tile
- 2--cinderblocks or concrete
- 3--plaster

Locker room ceiling

- 1--acoustic tile
- (no other material rated satisfactory)

According to the members of the National Athletic Institute<sup>25</sup> walls should be of materials resistant to moisture absorption, with smooth, easily cleaned surfaces. All

23. College Facilities For Physical Education, Health Education, and Recreation, p. 113.

24. Ibid.

25. Planning Facilities For Health, Physical Education and Recreation, p. 65.

external corners should be rounded. Voltmer and Esslinger<sup>26</sup> stated no wall should constitute a particular hazard because of its rough or uneven surface, or because of the likelihood that it may fall down, burn, or afford a breeding place for harmful bacteria and fungus growth.

The members of the Athletic Institute<sup>27</sup> in regard to the locker room floor recommended that it be of impervious materials, such as ceramic or quarry tile, with non-slip surface, and properly sloped toward drains. Concrete floors (non-slip surface) if used should be treated with a hardener to prevent the penetrations of odors and moisture. Wall and eight-inch locker bases should be coved and of the same material as the floor. Hughes<sup>28</sup> also recommended cork, tile or concrete with a color-hardened surface as a satisfactory material for the floors. Brownell<sup>29</sup> added that locker room floors should be easy to clean.

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26. Voltmer and Esslinger, op. cit., p. 167.

27. Planning Facilities For Health, Physical Education and Recreation, p. 65.

28. Hughes, op. cit., p. 295.

29. Administrative Problems in Health Education, Physical Education, Recreation, loc. cit.

Voltmer and Esslinger<sup>30</sup> in regard to drainage of the locker room floor, recommended the floor be sloped gradually to the drains which should be large enough to prevent overflow. Bartholomew<sup>31</sup> added that the floor should have sufficient drains to receive the water when the room is washed down. The National Facilities Conference<sup>32</sup> participants stated that the drainage pitch of the locker room floor should conform to standards set for shower rooms.

Lockers are needed for all pupils who will use the central dressing room. Storage lockers should be provided for physical education clothing and dressing lockers for street clothing. The number of storage lockers should be equal to the total enrollment plus ten percent to allow for expansion, according to the National Facilities Conference<sup>33</sup> participants. They recommended non-corrosive metal dressing lockers large enough to accommodate street clothes. These should be 12" x 12" x 72" for secondary schools. In addition to the dressing locker they also recommended a non-corrosive metal storage locker. The sizes of these lockers in order of preference are for boys and girls: 7½" x 12" x 24"; 6" x 12" x

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30. Voltmer and Esslinger, op. cit., p. 166.

31. Bartholomew, loc. cit.

32. A Guide For Planning Facilities For Athletics, Recreation, Physical and Health Education, op. cit., pp. 62-63.

33. Ibid.

36"; 7½" x 12" x 18". These lockers were selected as preferable sizes with proper length, width and depth relationships which could be used to store ordinary gymnasium costumes and allow free hanging for ventilation.

The Athletic Institute<sup>34</sup> members stated in some situations and certain regions it may be desirable to provide baskets for physical education clothing of each pupil based on the anticipated enrollment, however, on this same subject the participants of the National Facilities Conference<sup>34</sup> said that basket type lockers are not recommended for these reasons: basket type lockers do not allow for the hygienic care of dressing equipment; basket type lockers are not economical because they are constantly moved, and are then subject to hard wear, and because an attendant is essential for proper administration. If an attendant does not distribute the baskets, there is apt to be locker destruction and pilferage. Student attendants are not recommended. Hughes<sup>36</sup> recommended combination locks, with emergency master key control. He stated that the best arrangement of lockers is in rows perpendicular to the lighting walls with windows arranged that

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34. Planning Facilities For Health, Physical Education and Recreation, p. 66.

35. A Guide For Planning Facilities For Athletics, Recreation, Physical and Health Education, p. 62.

36. Hughes, op. cit., p. 295.

they come between rows. Small groups of lockers should be arranged in long narrow rooms.

The National Facilities Conference<sup>37</sup> participants recommended that lockers be placed on a solid coved base 6 to 8 inches high. Such a base is necessary to allow for cleaning or flushing of the floor without damaging the lockers or their contents. If lockers are placed back to back, the back should be screened and there should be 4" of space allowed between the backs. The same space should be provided between the backs of lockers and walls. Voltmer and Esslinger<sup>38</sup> stated that if metal lockers are used for storing equipment, they should be ventilated by sucking warm air through them and out-doors. Brownell<sup>39</sup> stated that mechanical ventilation of lockers is highly desirable; it is a necessity if natural ventilation is insufficient.

The National Facilities Conference<sup>40</sup> participants advocated stationary benches secured to the floor as essential. A seat board or hard wood, 8" in width, surfaced on

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37. A Guide For Planning Facilities For Athletics, Recreation, Physical and Health Education, p. 63.

38. Voltmer and Esslinger, op. cit., p. 176.

39. Administrative Problems in Health Education, Physical Education, Recreation, op. cit., p. 84.

40. Ibid.

four sides with rounded edges and corners is desired. The height of the bench for secondary schools is 16". Hughes<sup>41</sup> suggested benches with yellow pine tops.

According to the members of the Athletic Institute<sup>42</sup> space relations of lockers to bench, and bench to bench should be planned for traffic control and dressing comfort. Recommended allowances are 30" from lockers to bench, 8" for bench width and a 30" passage between benches. Benches should extend the full length of each locker bank, with traffic breaks at intervals of about twelve feet. Hughes<sup>43</sup> suggested that aisles should be fitted with a thin corrugated rubber matting or similar material.

The College Physical Education Association<sup>44</sup> made this observation in regard to the foot bath: "The foot bath is of doubtful value unless constantly maintained at its optimum disinfection concentration."

All sources reviewed agreed that a number of mirrors should be provided in the locker room; however, the location of the mirrors was dependent on the location of lockers, windows and available wall spaces. The College

41. Hughes, op. cit., p. 295

42. Planning Facilities For Health, Physical Education and Recreation, op. cit., pp. 66-67.

43. Hughes, op. cit., p. 296.

44. College Facilities For Physical Education, Health Education, and Recreation, op. cit., p. 56.

Physical Education Association<sup>45</sup> suggested that mirrors should be approximately 18" x 30". Wall mirrors should be 4' 6" from the floor, above a shelf 6" wide and as long as the mirror above it. Mirrors should not be placed above other facilities.

Members of the Athletic Institute<sup>46</sup> suggested that mirrors be encased in non-corrosive metal frames and permanently mounted on the walls. Stainless steel mirrors have been found highly desirable. Alcoves approximately 12' x 8' equipped with mirrors and ample shelving, are more suitable for girls. A full-length mirror is recommended near the main exit. Facial tissue dispensers are recommended in girls rooms.

A bulletin board or boards should be provided and should be placed near the doors leading to the locker room, according to Voltmer and Esslinger.<sup>47</sup>

Hughes<sup>48</sup> suggested fountains lodged in the walls, the depth of the recess being sufficient to prevent the projection of the fixture beyond the surface of the wall.

45. Ibid.

46. Planning Facilities For Health, Physical Education and Recreation, op. cit., p. 68.

47. Voltmer and Esslinger, loc. cit.

48. Hughes, op. cit., p. 295.

According to the Athletic Institute<sup>49</sup> members doors should be heavy-duty solid-core type treated to resist moisture. They should be of adequate size to handle a heavy flow of traffic and so arranged as to form a natural sight barrier if possible. Where glazing is required, lock rails should be four feet above the floor. Wire or tempered glass should be used.

Brownell<sup>50</sup> suggested direct outside windows are highly desirable. If necessary to place them below the gymnasium floor, outside windows may be effected by raising the gymnasium half a floor level. Members of the National Facilities Conference<sup>51</sup> stated windows should be located with regard to the height and arrangement of the lockers. According to the Athletic Institute<sup>52</sup> members dressing room windows should be operable. The window-stool height should be sufficient to clear the tops of the lockers. Windows should be glazed with obscure glass. Window frames should be bonderized or galvanized.

49. Planning Facilities For Health, Physical Education and Recreation, op. cit., p. 65.

50. Administrative Problems in Health Education, Physical Education, Recreation, op. cit., p. 84.

51. A Guide For Planning Facilities For Athletics, Recreation and Physical and Health Education, op. cit., p. 63.

52. Ibid.



## B. THE SHOWER ROOM

All persons should have an opportunity to take a shower following participation in physical education classes, school athletics, or community physical recreation activities according to the Athletic Institute<sup>53</sup> members. The shower room should be directly accessible to the towel room and the dressing room which it serves. When a shower room is designed to serve a swimming pool, the room should be located so that pupils must pass through the showers prior to entering the pool. The entrance should lead directly to the pool deck. The size of the shower room is predicated upon the type of showers (group, or individual with cubicle) and the number and spacing of shower heads. Voltmer and Esslinger<sup>54</sup> recommended 18 square feet for each shower head to accommodate 6 boys or 5 girls. Bartholomew<sup>55</sup> suggested that 16 to 25 square feet be allowed for each shower head.

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53. Planning Facilities For Health, Physical Education and Recreation, op. cit., p. 68.

54. Voltmer and Esslinger, op. cit., pp. 164-174.

55. Bartholomew, loc. cit.

The College Physical Education Association<sup>56</sup> suggested for women:

Eighty percent of the shower heads be of the open or group type and 20 percent of the individual booth type. Also when booth showers are used, dressing cubicles 3 feet by 3 feet should be adjoining and be equipped with a bench and clothes hooks of non-corrosive metals. In this case a single shower head can serve two to four cubicles. The shower cubicle should be 3 feet by 3 feet 6 inches.

Ventilation for the shower room follows the same recommendations as given for the locker room. The National Facilities Conference<sup>57</sup> participants recommended controlled ventilation for rapid removal of excess heat and moisture.

Lighting recommendations for the locker room were also advanced as adequate for the shower room. The Athletic Institute<sup>58</sup> members said that moisture-proof fixtures should be installed. Lights in the shower room should be controlled by a switch in the dressing room.

Heating units and temperature range of the locker room are also recommended for the shower room.

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56. College Facilities For Physical Education, Health Education, and Recreation, op. cit., p. 26.

57. A Guide For Planning Facilities For Athletics, Recreation, Physical and Health Education, op. cit., p. 61.

58. Planning Facilities For Health, Physical Education and Recreation, op. cit., p. 69.

The College Physical Education Association<sup>59</sup> set up the following rating scale for suggested surfaces in the shower room (3--good; 2--better; 1--best). Ratings were listed as follows:

Shower room floor

- 1--ceramic tile
- 2--abrasive terrazzo (marble)
- 3--abrasive, non-absorbent concrete

Shower room walls

- 1--glazed brick or ceramic tile
- 2--plastics

Shower room ceiling

- 1--acoustic tile
- (no other material rated as satisfactory)

Voltmer and Esslinger<sup>60</sup> also recommended the use of concrete and glazed brick as satisfactory material for ceiling. The Athletic Institute<sup>61</sup> members listed tile or Portland cement plaster as satisfactory ceiling covering.

The National Facilities Conference<sup>62</sup> listed:

Special feature requirements for the shower room:  
 Non-slip floor material with coved base.  
 Floor to drain to a gutter not to exceed six

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59. College Facilities For Physical Education, Health Education, and Recreation, op. cit., p. 79.

60. Voltmer and Esslinger, op. cit., p. 169.

61. Planning Facilities For Health, Physical Education and Recreation, op. cit., p. 69.

62. A Guide For Planning Facilities For Athletics, Recreation, Physical and Health Education, op. cit. p. 60.

inches along outside wall with ample drains. Three-eighths inch fall to one foot from center crown.

Gutters to be covered with non-corrosive durable grill or grate, flush with floor surface or recessed, and removable with key or wrench.

All plumbing should be recessed in the wall except valve and heads if a satisfactory servicing method can be devised; if not, exposed fittings and pipes should be tight to wall and well-secured.

Williams and Brownell,<sup>63</sup> in regard to ceiling construction, suggested a vaulted and water-proof ceiling surface to prevent moisture from dripping on bathers. Brownell<sup>64</sup> suggested in another publication dome-shaped shower room ceilings to shed water.

The wall surface of the shower room should follow the suggestions made by Voltmer and Esslinger<sup>65</sup> as was previously outlined, in regard to locker room walls. Hughes<sup>66</sup> recommended tile or marble wall construction. The Athletic Institute<sup>67</sup> members stated if walls enclosing the shower

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63. Williams and Brownell, The Administration of Health and Physical Education, p. 286.

64. Administrative Problems in Health Education, Physical Education, Recreation, op. cit., p. 84.

65. Voltmer and Esslinger, op. cit., p. 167.

66. Hughes, op. cit., p. 296.

67. Planning Facilities For Health, Physical Education and Recreation, op. cit., p. 69.

room are of ceramic or glazed tile units, or of marble, they should extend to the ceiling. Coved bases and rounded external corners are desirable.

Williams and Brownell<sup>68</sup> stated:

All doors and window sash require a copper covering to prevent rust or swelling. Since doors and windows must be opened frequently the cost of this expenditure is justifiable.

The members of the Athletic Institute<sup>69</sup> recommended floors be non-slip ceramic or quarry tile properly sloped toward drains. In the construction of the floor drainage gutters 2" deep and 8" to 10" wide around the perimeter of the shower room provide a sanitary means of drainage. All corners of the gutters should be rounded. Another method for draining found economical and satisfactory is to slope the floor to a recess approximately 30" x 30". The recess is covered by a removable non-ferrous grating.

In regard to flooring for shower rooms Hughes<sup>70</sup> suggested tile (ceramic, mosaic, terrazzo, non-slip) laid on concrete with a membrane water proofing underneath it and

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68. Williams and Brownell, op. cit., p. 284.

69. Planning Facilities For Health, Physical Education and Recreation, op. cit., p. 69.

70. Hughes, op. cit., p. 296.

up the sides of the walls. Impervious ceramic tile preferably an inch square, will prevent slipping.

Two methods are commonly used for water control in the shower room. One is the master control, operated by an attendant, which prevents any changing of the flow or temperature of the water by bathers. This is felt to be the less expensive method of installation because it can reduce the number of shower heads. The other method and probably more common is the individual control.

The National Facilities Conference<sup>71</sup> members stated in regard to showers:

Time available for showering, dressing and clothes storage is limited usually to 10-12 minutes. The prescribed number of shower heads is necessary to care for the peak period load in that time. In the group or gang type shower, the girls should be provided with a number of shower heads equal to forty percent of the designed peak period load; for the boys the number should be thirty percent of the designed peak period load, for example:

40 girls . . . . .	16 shower heads
40 boys . . . . .	12 shower heads

Shower heads should be installed at least 4' apart; should be non-clogging type and height of spray should be adjustable by use of a lock. If stationary heads are installed these should be placed that the top of the spray will be shoulder height (usually 4' 6" - 5' 0").

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71. A Guide For Planning Facilities For Athletics, Recreation, Physical and Health Education, op. cit., pp. 59-60.

One to three individual shower booths should be additionally provided for girls. The size of the booth should be 3' x 3' 6".

For boys, if walk-way or walk-around shower system is desired, the number of shower heads in the shower room can be reduced by one-third. In the walk-way the shower head must be spray type utilizing metal spray outlets attached to the water pipe and be focused to provide coverage from shoulder height to feet. These spray outlets must be situated so that a continuous spray will result throughout the length on the walk-way; and arranged to provide tepid, warm and cool water as one progresses, through the walk-way. The walk-way should be arranged in U shape with a total length of at least 35 feet and be from 3' to 4' in width. An entrance from the group shower soaping space and egress to the towel room and swimming pool should be provided.

Williams and Brownell<sup>72</sup> have the following to say about individually controlled showers:

Where individual control showers are installed, two types of valves are recommended with advocates for each. One group favors the single valve which automatically mixes the hot and cold water according to the number of times the wheel is turned. The other group prefers two valves; one of hot water, the other for cold. While the single valve type is more convenient, economy of installation and repair suggest the use of two valves. Fewer accidents occur when wheel controls, rather than levers, adjust the flow of water.

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72. Williams and Brownell, loc. cit.

The College Physical Education Association<sup>73</sup> made the following recommendations in regard to showers:

The shower head should be placed at shoulder height, be individually controlled and be of the adjustable ball and socket wall type. They should be equipped with mixing valves and anti-scald devices. They should be self-cleaning. All fittings should be non-corrosive and tamper proof. Plumbing should be concealed, but accessible through access plumbing chambers.

Hughes<sup>74</sup> recommended in regard to showers:

A self-cleaning type of shower head which will supply a stream of varying size and force. Dual type valves or the automatic valve control with a chain pull and a ring on the end which can be pulled down and attached to a hook on the partition. In the latter type the temperature of the water is controlled by a thermostat. Temperatures may be fixed permanently and not subject to student control. Some showers are set for the warm bath, others for the cold. This type of shower is also economical. It requires only one pipe and one valve and no mixing adjustment. Moreover, there is no waste of time and water while the temperature of the water is being adjusted.

The shower should also be of the adjustable neck wall type, arranged to spray toward the back of the booth. Valves should be placed so they may be operated without getting in the water.

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73. College Facilities For Physical Education, Health Education and Recreation, op. cit., p. 26.

74. Hughes, op. cit., p. 296.



The Athletic Institute<sup>75</sup> members suggested in regard to showers:

Temperature controls are necessary to keep water from exceeding 120° F. Both individual and master controls are needed for all group showers. Cubicle showers should have individual controls.

The College Physical Education Association<sup>76</sup> recommended:

Soap for the group shower room should be furnished through liquid soap dispensers, one between alternate showers. They should be non-corrosive metal, tamper-proof, and easy to operate and maintain. For the girls' individual booth showers, either liquid or bar soap dispensers can be used. Where bar soap is used, soap dishes should be provided.

Hughes<sup>77</sup> agreed with this as does the Athletic Institute<sup>78</sup> members. In addition they contend that the soap outlets should be supplied from a central reservoir of sufficient size to hold several days supply. The National

75. Planning Facilities For Health, Physical Education and Recreation, op. cit. p. 69.

76. College Facilities For Physical Education, Health Education and Recreation, op. cit., p. 27.

77. Hughes, op. cit., p. 296.

78. Ibid.

Facilities Conference<sup>79</sup> said the dispensers should be installed on the wall at shower control valve height at a rate of one between each two showers.

Hughes<sup>80</sup> also suggested in regard to hardware in the shower room, that all hardware with the exception of the towel bar be of brass or bronze. The towel bar should be of chromium metal or other non-rustable bar upon which the bathers may hang the towel while taking the bath.

The College Physical Education Association<sup>81</sup> stated:

The drying room should have the same total square foot floor area as the shower room and be immediately accessible to both showers and dressing room with entrance to each.

Special features of the drying room: a ledge 18 inches high and 8 inches wide coved at wall and base, with bull nose edge, as foot drying aid is desirable.

It towel distribution is such that hanging towels in drying room is necessary, a towel bar is recommended. This one-inch non-corrosive pipe should be 4 feet from the floor securely anchored, 1 inch to 1½ inches from the wall.

The National Facilities Conference<sup>82</sup> members agreed

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79. A Guide For Planning Facilities For Athletics, Recreation, Physical and Health Education, op. cit., p. 60.

80. Hughes, op. cit., p. 286.

81. College Facilities For Physical Education, Health Education and Recreation, op. cit., p. 27.

82. Ibid.

in regard to size and location of the drying room. They also added that if the drying room is used in connection with the swimming pool, hair dryers should be provided for girls. Their suggestions concerning the foot drying ledge and towel hanging are the same. They suggested that the walls should extend from the floor to the ceiling. A non-shatterable transparent 2' 6" panel for supervision of toweling located 3' 6" from floor to 6' in the wall between the toweling and dressing room may be desired. Controlled ventilation and drainage pitch of floor are features suggested similar to suggestings made for locker room.

Most of the literature surveyed recommended that towels for the physical education classes be provided for hygienic and sanitary reasons. Duncan and Forsythe<sup>83</sup> made this statement in regard to towels: "Nothing but strictly individual use of towels should be tolerated."

The College Physical Education Association<sup>84</sup> made the following recommendations in regard to hair dryers:

In the girls locker room it is suggested that dryers be installed. They should be placed in a row, on a shelf convenient to

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83. Ray O. Duncan and Charles E. Forsythe, Administration of Physical Education, p. 220.

84. College Facilities For Physical Education, Health Education and Recreation, op. cit., pp 63-64

sitting height for the girls. Enough dryers should be installed to handle the peak load with a ratio of one dryer for every four girls.

Friswold<sup>85</sup> recommended one hair dryer for every 10 to 16 boys.

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85. Friswold, loc. cit.

### C. THE TOILET FACILITIES

The members of the Athletic Institute<sup>86</sup> recommended toilet facilities be provided in the following places: central dressing room; team and community recreation dressing room; and a small unit adjacent to shower, towel and first-aid rooms. Toilets for public use should be conveniently available to the foyer, auditorium and gymnasium.

The National Facilities Conference<sup>87</sup> participants recommended toilet facilities and lavatory facilities should be provided in proportion to the peak period loads in the central dressing rooms, as well as in the team and community recreation dressing rooms. In planning toilet facilities, provisions should be made for direct access to outdoor activity areas.

Toilet and lavatory facilities should be provided in proportion to the designed peak period load on the following basis:

Toilets	Girls	1-30	Minimum	3
Toilets	Boys	1-50	"	2
Urinals	Boys	1-25	"	2
Lavatories	Boys and Girls	1-20	"	3

This standard is more liberal than other toilet areas in the school because of intensive use in limited time before and after class.

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86. Planning Facilities For Health, Physical Education and Recreation, op. cit., pp. 69-70.

87. A Guide For Planning Facilities For Athletics, Recreation, Physical and Health Education, op. cit., pp. 63-64.

The following summary is taken from the College Physical Education Associations'<sup>88</sup> book on health, physical education and recreation facilities:

For the lavatories, it is recommended that washbasins be of vitreous china. They should be of control-spring-faucet type which may be hand or foot operated. The faucets should be non-corrosive and non-breakable material. The operating controls should be tamper-proof. The faucets should automatically close slowly if the water is left on. Provisions should be made for both hot and cold water through a common outlet, or automatically mixed.

It is recommended that urinals be of impervious material of the stall type with integral lip. The base of the urinals should be flush with floor, and the floor pitched to drain into the urinals. The urinals may be flushed by hand, foot, or automatic control.

The water closet should be of vitreous china, the seat should be of impervious material and have an open front. The bowls should be elongated or extend-lip siphon jet type. They may be equipped with flush valves of non-automatic concealed type. The height of the toilet bowls from floor to rim should be 13" for secondary schools.

Stall partitions should be mark-proof, non-corrosive and durable material. There should be no cross pieces or fixtures upon which people may hang. There should be installed in each stall a coat hook for hanging clothing and a shelf for books or purses. The stall partition should start 12 inches above the floor and extend to a total height of 5 feet to 5 feet 6 inches. If doors are added, they should be of similar height. Gravity hinges are recommended. Doors should swing into compartments and stand open when vacant.

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<sup>88</sup>. College Facilities For Physical Education, Health Education and Recreation, p. 93.

Hughes<sup>89</sup> suggested the following standards for toilet areas:

floors: ceramic tile, or other non-absorbent material, in waterproof cement is most satisfactory

wains-coting: white or light cream glazed tile, opaque glass, or other non-absorbent material are in general use.

bowls: porcelain is recommended

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89. Hughes, op. cit., p. 297.

## CHAPTER III

TABULATION OF RECOMMENDED STANDARDS AND EXISTING  
LOCKER AND SHOWER ROOM FACILITIES AT  
SOUTH DAKOTA STATE COLLEGE

This chapter presents the recommended standard facilities defined by learned authorities and organizations and outlined in Chapter II of this problem and the existing facilities at South Dakota State College in table form for ease of reference and comparison.



TABLE I

## LOCKER ROOM

Facilities	Recommended Standards	SDSC
Location:	<p>The locker room should be located to serve both indoor and outdoor teaching stations. It should be on the same level as the gymnasium and connected to it. It should be directly accessible to the shower and equipment room.</p>	<p>The northeast and the south boys locker room have doors leading to the gymnasium and outdoors. In order to reach the gymnasium or outside from the boys northwest physical education locker room students must pass through the shower room. In the girls locker room there is no direct passage to outside. Girl participants must go through the gymnasium to outside activity stations. The locker rooms are all on the same level as the gymnasium. All locker rooms are directly accessible to shower room and all are directly accessible to the equipment rooms with the exception of the northwest locker room and again students must pass through the shower room to reach the equipment room. From the south locker room students must pass through the gymnasium and a public corridor in order to reach the equipment room.</p>

<u>Facilities</u>	<u>Recommended Standards</u>	<u>SDSC</u>
Shape:	A large locker room should be square or nearly square.	All locker rooms are rectangular.
Size:	An average from 4 square feet per student to 14 square feet per student inclusive has been recommended.	Girls: 13.95 square feet per student during peak load period. Boys: including varsity room 25.28 square feet per student during peak load period. Boys: excluding varsity room 16.46 square feet per student during peak load period.
Height:	Locker rooms should have a height of at least 10½ feet.	Locker room ceilings measure 10' 11".
Ventilation:	Ventilation should be accomplished by mechanical means or by the window-gravity method.	All rooms are ventilated by the gravity method through adjustable windows or through ceiling ducts.
Lighting:	Natural: Rooms should receive an abundance of direct sunlight preferably from the south.  Artificial: Studies indicate a preference for a diffused type rather than direct.	All rooms have direct light through outside windows with the exception of the boys south locker room which has no outside windows and the boys east room which has none at all. The girls locker room is the only one with southern exposure. A skylight in the room has been covered over.  Artificial lighting is achieved by direct incandescent lighting.

<u>Facilities</u>	<u>Recommended Standards</u>	<u>SDSC</u>
Temperature:	A range of 80° - 85° F. at a level 4 feet above the floor.	The temperature is very uneven because of poor ventilation and arrangement of doors. One room may be 90° and another 60° at the same time.
Floors:	Ceramic tile, abrasive terrazzo, abrasive concrete, cork or concrete with a color-hardened surface. Wall and 8 inch locker bases should be coved and of the same material as the floor.	Flooring is asphalt tile. A wooden coved base board has been laid around the girls locker floor perimeter but its purpose is defeated because heating pipes are placed in front of it.
Walls:	Glazed brick, ceramic tile, cinder-blocks, concrete and plaster are satisfactory. All external corners should be rounded.	Walls are plaster painted with enamel. External corners are somewhat rounded.
Ceiling:	Acoustic tile or plaster painted white.	Ceilings are plaster painted light green.
Drains:	Drainage pitch should conform to standards for shower rooms. Drains should be large enough to receive water when the room is washed down and not overflow.	There are no drains provided and therefore moisture lays on the floor and makes cleaning difficult and flushing impossible.
Lockers:	Storage lockers for physical education clothing should be provided. The number should be equal to total enrollment plus 10% to allow for expansion. The preferred size is: 7½" x 12" x 24".	In the boys south locker room 208 one-half length lockers and 6 combination storage-dressing lockers are installed. In the boys east locker room there are 146 one-half length lockers. The

FacilitiesRecommended StandardsSDSC

Lookers:  
(Cont.)

A non-corrosive metal dressing locker should be provided. They should be large enough to accommodate street clothes. The preferred size is: 12" x 12" x 72".

Some authorities believe baskets are satisfactory; others disagree believing them to be expensive and unsanitary.

aisle between the varsity room and training room houses 20 one-half length lockers. Locker facilities in the varsity room includes 97 full length lockers, 6 one-half length and 21 one-third length. The boys northwest locker room is equipped with 99 one-third length lockers and 44 full-length.

During the 1957-58 winter quarter the boys total physical education enrollment was 500. Adding 10% to this number to allow for expansion there should be 550 lockers to serve class enrollment. Not counting the full-length lockers used by the varsity team the locker rooms are equipped with 479, leaving a deficit of 71. The number 500 does not include the overflow of varsity participants and the physical education majors who also use the facilities. With this in mind it is easy to see that the actual deficit exceeds the estimated 71.

The girls locker room is equipped with 96 combination storage dressing lockers and 220 one-half length lockers.

<u>Facilities</u>	<u>Recommended Standards</u>	<u>SDSC</u>
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**Lockers:**  
(Cont.)

During the 1957-58 winter quarter the total enrollment for girl's general physical education was 270. Using this number as a base and adding 10% to allow for expansion the girls locker room should be equipped with 296 lockers. I found the number to exceed that. The girl's locker room has 316 lockers. This number 270 also does not include majors or girls signed up for special classes and activities.

**Locks:**

Combination locks with emergency master-key control.

The lockers are provided with combination locks and an emergency master key is available.

**Arrangement of Lockers:**

In rows perpendicular to lighting walls with windows arranged so they come between rows.

The boys northwest locker room has lockers arranged according to standard with the windows between rows. In all other locker rooms the arrangement is parallel to the lighting walls.

**Placement of Lockers:**

Lockers should be on a solid coved base 6 to 8 inches in height to facilitate cleaning and flushing of the floor.

Four inches of space should be allowed between backs of lockers if back to back and between backs and wall.

There is no space arrangement made for lockers. The only lockers that are off the floor are on a 2"x4" and that arrangement has been made to facilitate leveling and clear heating pipes. Lockers placed back to back are bolted to each other and no space

<u>Facilities</u>	<u>Recommended Standards</u>	<u>SDSC</u>
Placement of Lockers: (Cont.)		is provided for ventilation. Lockers back to wall are away from the walls but only because of pipe arrangement.
Ventilation of Lockers:	Storage lockers should be ventilated by sucking warm air through them. Mechanical ventilation is a necessity if natural ventilation is insufficient.	There is no mechanical ventilation. There is some natural ventilation through locker door front or floor but I doubt that it is sufficient.
Benches:	Stationary with a yellow pine seat board of hard wood 8" in width and surfaced on 4 sides with rounded edges and corners and 16" high.	The benches are not stationary or standard but the majority are 7½" wide, 20" high and 11' 10" long. Some are surfaced on 4 sides with rounded edges and corners. There is a great deal of irregularity of benches in the boys locker rooms.
Space Relationship of Benches:	Space should be planned for traffic control and dressing comfort. Recommended allowances are 30" from lockers to bench 8" for bench width and 30" passage between benches.	Since benches are not stationary there is no standard space relationship.
Aisles:	Aisles should be fitted with a thin corrugated rubber matting or similar material.	There is no matting provided on the aisles.

Facilities	Recommended Standards	SDSC
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**Footbath: ✓**

Should be maintained at its optimum disinfection concentration. Authors disagree as to value of footbath.

There is no footbath provided.

**Mirrors:**

Mirrors should be provided, the location dependent upon lockers, windows and available wall spaces. 18" x 30" is a convenient size. Wall mirrors should be 4' 6" from the floor above a 6" shelf.

All mirrors should be encased in a non-corrosive metal frame and permanently mounted.

Alcoves equipped with mirrors and shelving are desirable for girls.

A full length mirror near the exit is desirable.

Mirrors are provided in all locker rooms. In the boys locker room there is a total of 10 small mirrors. In the girls there is a full length mirror and 3 small mirrors. All small mirrors in the boys room are above a shelf 24" x 4". Mirrors are encased in wood painted enamel and permanently mounted on the walls.

The full length mirror provided in the girls room is not near the exit but close to the doorway between shower and locker room.

**Bulletin Boards:**

Should be provided near the doors leading to locker rooms.

The boys north locker rooms are equipped with 9 bulletin boards. The south locker room has none.

The girls locker room has 3 bulletin boards.

**Fountains:**

Fountains should be lodged in the walls so as not to project beyond the surface of the wall.

Fountains are provided in toilet areas, which are directly adjacent to locker rooms. The fixtures are not recessed. There are 3 fountains in the boys rooms and 1 in the girls room.

Facilities	Recommended Standards	SDSC
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**Doors:**

Doors should be of the heavy-duty solid-core type resistant to moisture. They should form a natural sight barrier if possible.

If glazing is required lock rails should be 4 feet above the floor and tempered glass or wire should be used.

The inside doors are wood painted enamel rendering them moisture resistant. The door to the boys east locker room opens directly off the gymnasium and offers no sight barrier whatsoever. The outside doors from the north locker room have glass windows which are not frosted and someone outside can see directly into the change room.

**Windows:**

Direct outside windows are highly desirable. They should be located with regard to height and arrangement of lockers. They should be operable. Windows should be glazed with obscure glass. Frames should be bonderized or galvanized.

All locker rooms have outside windows with the exception of the boys south room and the boys east locker room.

Windows are operable and have clear type glass panes.



TABLE II

## SHOWER ROOM

Facilities	Recommended Standards	SDSC
Location:	<p>The shower room should be directly accessible to the towel- eling and dressing rooms. If designed to serve a swimming pool it should be lo- cated so pupils must pass through the sho- wers prior to entering the pool.</p>	<p>In all cases the shower room is di- rectly accessible to the locker room.</p>
Size:	<p>Dependent upon the type of showers (group, or individual with cub- icle) and number and spacing of shower heads.</p> <p>The recommended al- lowances are from 18 square feet per head to 25 square feet inclu- sive or not less than 1 shower for each 4 per- sons at peak load peri- od.</p>	<p>Figuring only the actual shower area in the 6 cubicles of the girls shower room 51 square feet or less than 1 square foot per student is available during a peak load period of 60 students. Six cubicles average 1 to every 6 bathers.</p> <p>The two boys sho- wer rooms figured to- gether afford a total of 3.2 square feet per student during a peak load period of 80 students. Assuming the boys showers are all in working order and the peak load is distributed propor- tionately between sho- wer rooms there is the recommended ratio of 1 shower head to every 4 students exactly.</p>

<u>Facilities</u>	<u>Recommended Standards</u>	<u>SDSC</u>
Ventilation:	The same recommendations are advanced as for locker rooms.	Ventilation is achieved through the gravity-type method by use of adjustable windows and ceiling air ducts.
Lighting:	The recommendations for the locker room are adequate for the shower room. Moisture-proof fixtures should be installed. The control switch should be in the dressing room.	Facilities are the same as in the locker room. They are direct incandescent lighting. The control switch is outside the shower room.
Heating:	Units and temperature range of the locker room are also recommended.	Radiated heat is provided in the shower room as in the locker room. Uneven temperature range is common here too.
Floors:	Ceramic tile, abrasive terrazzo, abrasive non-absorbent concrete with membrane of water-proofing underneath. Properly sloped toward drains with coved bases.	Flooring in the north boys shower room is impervious 6-sided ceramic tile. Flooring in the south boys shower room is concrete. Flooring in the girls shower room is non-treated concrete.
walls:	Glazed brick or ceramic tile, plastic, marble. Coved bases and rounded external corners are desirable.	The walls of the boys shower room are an extension of the floor up to shower height 6' 1". The size of the tile is larger and rectangular. Continuing to the ceiling from the tile the wall is plaster.

# Facilities      Recommended Standards      SDSC

## Walls: (Cont.)

In the boys south shower room the walls are plaster.

In the girls room marble walled cubicles are provided.

## Ceiling:

Acoustic tile, concrete, glazed brick, Portland plaster cement.

A vaulted and water-proof ceiling surface will prevent moisture from dripping on bathers.

A non-vaulted ceiling of plaster painted enamel.

Shower room ceilings are of the same height as locker room ceiling 10' 11".

## Drains:

Gutter 2" deep and 8" to 10" wide around perimeter of shower room. All corners should be rounded.

Another method is to slope the floor to recess 30". Recess covered by removable non-ferrous grating.

There is a gradual slope to two surface drains in the boys shower rooms.

In the girls shower room floors running under cubicles slope gradually to two surface drains.

## Gutters:

Covered with non-ferrous, non-corrosive durable grill or grate flush with floor surface or recessed and removable with key or wrench.

Gutters are flush with the floor and have a removable grill.

## Plumbing:

Should be recessed in the wall except valve and heads if a satisfactory method can be devised. If not exposed fittings and pipes should be tight to the wall and well-secured.

Most fixtures are recessed in the wall.

Facilities	Recommended Standards	SDSC
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**Windows and Doors:**

Windows and doors require a copper covering to prevent rust or swelling. Since they must be opened frequently the cost is a justifiable expenditure.

The shower room windows are similar to the locker room windows. They are a wooden structure painted with enamel rendering them somewhat impervious to moisture.

**Water Control:**

Two methods are commonly used:

1. Master Control operated by an attendant prevents any changing of flow of water or temperature by bathers. Less expensive. Can reduce number of shower heads.
2. Individual Control

The water flow control is done by bathers. The bathers preference determines the temperature of the water.

**Number of Showers:**

Group or gang type:  
40 girls . . 16 heads  
40 boys . . 12 heads

1 to 3 individual booths should be provided additionally for girls. Booth size: 3' x 3' 6".

The number of shower heads can be reduced by 1/3 if the walk-way shower system is used.

In the north boys shower room 12 gang type shower heads are furnished at 5' 10" from the floor. In the south boys shower room 9 gang type heads are provided, one of which does not work.

Girls bath in 6 cubicles with 1 shower head each. The cubicles measure 2' 11" x 2' 11". The shower head is 5' 10" above the floor and the control valves are 4' 8" above the floor. I found only three heads to be in proper working order. The remaining three were clogged.

FacilitiesRecommended StandardsSDSC**Type of  
Showers:**

Non-clogging, self-cleaning type. The height of the spray should be adjustable by use of a lock. If stationary heads are used the spray top should be shoulder height. (4' 6" - 5' 0")

Valves should be placed so they can be operated without getting into the water.

Two types of valves:

1. Single Valves automatically mixes hot and cold water according to number of times valve is turned. Fewer accidents with this type of valve.
2. Double Valves one hot water the other is cold. Economy of installation and repair.

All fittings should be non-corrosive and tamper-proof.

**Temperature  
Controls:**

It is necessary to keep water from exceeding 120° F. Both individual and master controls are needed for group showers. Cubicle showers demand individual controls.

Shower heads are stationary. At one time they could be adjusted but now they are out of order. Spray is shoulder height.

Valves are double type. The water is mixed through a common outlet and individually controlled through separate hot and cold water valves.

Both gang type and booth showers are individual temperature controlled. The bather's preference determines the temperature of the water.

<u>Facilities</u>	<u>Recommended Standards</u>	<u>SDSC</u>
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**Soap:**

Liquid soap should be furnished and delivered through soap dispensers between alternate showers. They should be installed on the wall at shower control height. The central reservoir should be of sufficient size to hold several days supply. The dispensers should be non-corrosive metal tamper-proof, easy to operate and maintain.

If bar soap is used, soap dishes should be provided.

There are liquid soap dispensers on alternate showers but they are not used. Recessed soap dishes are provided between alternate showers in the boys north shower room.

**Hardware:**

All with exception of towel bar should be brass or bronze. Towel bar should be chromium or other non-rustable material.

There are no towel bar installations in the shower room nor other installations that would be classified as hardware.

**Drying Room:**

A drying room should be of the same total square feet floor area as the shower room and be immediately accessible to it.

A foot drying ledge 18 inches high, 8 inches wide, coved at wall and base with bull-nosed edge.

A one-inch non-corrosive towel bar 4 feet from floor securely anchored 1 inch to 1½ inch from wall.

Walls should extend from the floor to the ceiling.

There are no drying or towel rooms.

Facilities	Recommended Standards	SDSC
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Drying  
Room:  
(Cont.)

A non-shatterable transparent 2' 6" panel for supervision of toweling located 3' 6" from the floor to 6' in the wall between toweling and dressing room.

Controlled ventilation and drainage pitch of floor and other features of shower room are the same.

Towels:

Towels should be provided for hygienic and sanitary reasons.

Clean towels are provided upon request from the supply room.

Dryers:

One dryer for every 4 girls placed on a shelf convenient to sitting height.

One dryer for every 10 to 16 boys.

No dryers are supplied either for boys or girls.

TABLE III

## TOILET FACILITIES

Facilities	Recommended Standards	SDSC
Location:	Central dressing room, team and community recreation rooms; small unit adjacent to shower, towel and first-aid rooms. Direct access to outdoor activity areas. For public use available to foyer, auditorium and gymnasium.	Toilets are immediately adjacent to the shower and locker rooms. However, in order for participants or public persons to use the facilities they must first pass through the dressing rooms.
Number:	<p>Toilets girls 1-30 3  Toilets boys 1-50 2  Urinals boys 1-25 2  Lavatories 1-20 3  (boys &amp; girls)</p> <p>The number recommended is more liberal because of intensive use in a limited time before and after class.</p>	<p>Toilets girls 2  Toilets north boys 4  Toilets south boys 2  Urinals boys 8  Lavatories 7  (boys &amp; girls)</p>
Floors:	Ceramic tile, or other non-absorbent material in waterproof cement.	Asphalt tile is used in the toilet areas as in the shower and locker rooms.
Wain- scoting:	White or light cream glazed tile, opaque glass or other non-absorbent material.	None in either boys or girls toilet areas.



Facilities      Recommended Standards

SDSC

**Stall  
Partitions:**

Mark-proof, non-corrosive durable material. No cross pieces or fixtures on which people may hang. A coat hook for hanging clothing and a shelf for books or purses.

The partition should start 12" above the floor and extend to a total height of 5' to 5' 6".

The doors should be of similar height with gravity hinges. They should swing into the compartments and should stand open when vacant.

Wood painted enamel partitions. In the girls area the partitions start 12" above the floor and extend to a height of 6' 11". The doors swing into the compartment on gravity hinges and stand open when vacant. No shelves are provided inside the stalls.

Only two toilets in the boys area have partitions. They begin 12" from the floor and extend to a height of 5' 6". They have no doors.

**Lava-  
tories:**

The wash-basins should be of vitreous china with control spring faucet either hand or foot operated. Faucets should be non-corrosive and non-breakable. Operating controls should be tamper-proof and should automatically close slowly if the water is left on. Hot and cold water through a common outlet or mixed automatically.

The wash-basins are of the recommended vitreous china in both boys and girls rooms. In the girls room the faucets are not spring control and hot and cold water are separate, with no common outlet. In the boys south shower room hot and cold water through a common outlet. One cold faucet is used for a fountain. In the boys north shower room the valves and outlets are separate.

**Urinals:**

Impervious material of stall type with integral lip. Base flush with floor and floor pitched to drain into

Urinals are of impervious material with an integral lip. There are two types: the floor type and pedes-

Facilities	Recommended Standards	SDSC
Urinals: (Cont.)	the urinals. May be flushed by hand, foot or automatic control.	tal type. They are hand flushed.
Water Closets:	Vitreous china seat of impervious material with open front. Bowls should be elongated or extend-lip siphon jet type. They may have flush valves or non-automatic concealed type. Height of toilet bowls from floor to rim is 13".	Toilets have the elongated bowls and open front and are flushed by hand. The toilets in the boys south room and the girls measure 15" from floor to rim. Toilets in the boys north room conform to standard and measure the recommended 13".

## CHAPTER IV

### CONCLUSIONS AND RECOMMENDATIONS

In conclusion it appears that the physical education facilities of South Dakota State College studied in this survey are a great deal less than might be expected from a school of this size. After a thorough study of the recommendations and standards as outlined in Chapters II and III it is easy to see that inadequacies exist in the facilities of South Dakota State College. These inadequacies are in the nature of equipment, construction materials and health and safety features.

One of the most noticeable situations is the lack of enough proper lockers. The school is not equipped with both dressing lockers and storage lockers as recommended by leading authorities. The total number of boys lockers is high and at first consideration one might assume quite adequate to meet the demand. However, not only do the general physical education classes make use of the lockers but the athletic varsity participants do also as do the physical education majors. Previously, I estimated the deficit during winter quarter to be approximately 70 lockers for general physical education classes alone. Additional lockers are needed for the overflow of varsity participants and physical education majors.

Also in regard to lockers no provision has been made for ventilation. Authorities agreed that lockers should be placed so as to provide a 4 inch space behind the cabinet to facilitate ventilation. Since lockers have been bolted back to back or placed back to wall natural ventilation is impossible and no mechanical means has been provided to supplement the absence of natural free circulation of air. Authorities also recommended that lockers be placed upon a base 6 to 8 inches off the floor to facilitate cleaning and flushing of the floor and prevent damage to the locker and its contents. The placement of the lockers directly on the floor makes proper cleansing difficult.

The construction material used for ceiling, walls and floor of locker and shower rooms does not meet the standards advanced in Chapter II of this study. Plaster used in the construction of walls is only the 3rd choice of some authorities. Others do not recognize it as a satisfactory wall covering at all. The rough surface of plaster constitutes a hazard and may afford a breeding place for harmful bacteria and fungus growths. A smoother surfaced wall would be easier to clean. The same authorities advanced acoustic tile as the only satisfactory ceiling covering. Plaster ceiling is not recognized as an adequate material. Plaster does not render the ceiling acoustical as advanced by the authorities and the oil paint on the ceiling reduces the sound-absorbent qualities. The authorities also believed

a vaulted or domed shower room ceiling is preferable to the other type.

Asphalt tile as used in the South Dakota State College locker rooms and toilet areas is not recognized as a suitable flooring material by the authorities. The same people also advanced coved wall and locker bases of the same material as the floor. The South Dakota State College locker rooms are not constructed with such wall and locker bases.

The benches in front of lockers are not stationary to prevent possible injury from slipping and falling. A rubber matting which is lacking would provide a non-skid surface and establish clean-dry aisles for bare feet.

In regard to health and safety only the girls locker room receives the recommended southern direct exposure to natural light. A sky light in the girls locker room has been covered over. Two boys locker rooms have no outside windows at all. No mechanical means of ventilation or moisture control is provided to insure proper amounts of either. Ventilation is dependent upon the sometimes insufficient natural type. A mechanical exhaust system would provide positive results. Proper ventilation would insure proper moisture control.

Artificial lighting is done by the old-fashion bare bulb instead of the preferred diffused method. Installation of more modern fixtures could easily correct this deficiency.

Hair dryers are credited as an excellent health device. The absence of dryers in both boys and girls shower rooms means students leave physical education classes with wet or damp hair.

Although the type of heating conforms to the standard, radiated heat. The location of the radiators does not. Authorities prefer radiators recessed in the walls or placed above heights of pupils. In two boys locker rooms radiators have recently been raised above locker height. If the radiators are recessed protecting bars or grates should be used. No protection is provided in the South Dakota State College locker room in regard to radiators.

Drainage facilities in the locker room is nil as no drains are provided. This means moisture stands on the floor and provides unsanitary conditions. The absence of drains makes proper cleaning difficult and flushing of the floor impossible.

Minor repairs in the girls shower cubicles would help relieve the situation there. Since only 3 showers of 6 operate correctly this cuts facilities to 50%. Even if these cubicles were put into working order more facilities would be desired. In a class of 60 the present number of shower heads would demand that a total of 10 girls use one facility. The existing condition demands that 20 girls use one facility. The average square footage per student

actually figures less than 1 square foot per student in a peak load period in girls general physical education.

An error to plan dressing and shower room areas so as to reduce foot traffic to a minimum has caused traffic circulation from locker rooms to supply and gymnasium through the shower rooms.

Failure to provide and properly locate toilet facilities to serve participants and spectators has caused another glaring error. Activity spectators in the gymnasium are not provided with public toilet facilities. They must make use of facilities in the locker room. This may cause traffic congestion, disturbance of class work, decrease comfort and safety of occupants and reduce the ease of supervision and desirable segregation of classes.

Even though nothing has been said previously in Chapters II or III in regard to hot water supply, I feel that it is pertinent to this study to mention the shortage of adequate hot water to handle the present demands at South Dakota State College.

Final recommendation, in my opinion, should be that an entirely new building is needed to handle the situation. The present building was built for ROTC purposes, primarily, in 1918.

## LITERATURE CITED

## A. BOOKS

- Caudill, William W., Toward Better School Design. New York: F. W. Dodge Corporation, 1951.
- Duncan, Roy O., and Charles E. Forsythe, Administration of Physical Education. New York: Prentice-Hall, Inc., 1951., p. 220.
- Hughes, William Leonard., Administration of Health and Physical Education in Colleges. New York: A. S. Barnes and Company., Incorporated., 1935., Pp. 295-297.
- Vannier, MaryHelen, and Hollis F. Fait, Teaching Physical Education in Secondary Schools. Philadelphia and London: W. B. Saunders Company., 1957., P. 90.
- Voltmer, Edward P., and Arthur A. Esslinger, The Organization and Administration of Physical Education. New York: Appleton-Century-Crofts, Inc., 1949., Pp. 161-178
- Williams, Jesse P., and Clifford L. Brownell, The Administration of Health and Physical Education. Philadelphia; W. B. Saunders, Co., 1948., Pp. 161-178.

## B. PERIODICAL LITERATURE

- Bartholomew, C., "Standards for Locker and Shower Rooms", The Journal of Health and Physical Education, 12:29-31, January, 1941.
- Friswold, I. O., "Locker and Shower Room Facilities", The American School Board Journal, 100:55-56, January, 1940.



### C. PUBLICATIONS OF LEARNED ORGANIZATIONS

"Administrative Problems in Health Education, Physical Education and Recreation", American Association For Health, Physical Education and Recreation, A Department of the National Education Association, Washington: 1953., P. 84.

"A Guide For Planning Facilities For Athletics, Recreation, Physical and Health Education", The National Facilities Conference, Chicago: The Athletic Institute, 1947., Pp. 57-108.

"Planning Facilities For Health, Physical Education and Recreation", The National Facilities Conference, Chicago: The Athletic Institute, Inc., 1956., Pp. 64-70.

The College Physical Education Association, "Standards for Design and Construction", The College Facilities For Physical Education, Health Education, and Recreation, Flushing, New York: Queens College, 1948., Pp. 7-70.