5. Ecologically Sustainable Development (ESD)

5.1 Dandenong 7–12 High School

'As we work towards achieving the goals of the decade, schools will be important in preparing and empowering students to assume responsibility for creating and enjoying a sustainable future. Such a vision for school education is transformative. It is more than a curriculum issue and requires a whole-school approach and innovative teaching and learning."[14]

Ecologically sustainable school buildings encourage the creation of teaching spaces that help improve learning outcomes and provide opportunities for buildings to be used as 'textbooks' in curriculum integration.

There is a consistent body of evidence linking particular factors to improved educational outcomes. These include:

- Air movement and ventilation – poor air movement and ventilation can result in increased student absenteeism and a reduction in student performance
- Thermal comfort – considered to affect both teacher performance and student achievement
- Classroom lighting – appropriate classroom lighting can improve test scores and reduce off-task behaviour
- Natural daylight – has been linked to faster progression in maths and reading. A study of over 2000 classrooms indicated that students with the most classroom daylight progressed 20 per cent faster in one year on maths tests and 26 per cent faster on reading tests than those in classrooms with the least amount of natural daylight.
- Acoustics – good acoustics are considered fundamental to good academic performance, both in terms of external noise and noise within the classroom.

ESD strategies that should be considered for incorporation into a school building design include:

- Openable windows with good cross flow and/or high-level extraction, combined with ceiling sweep fans
- Effective shading of windows
- Deep shading to the north will eliminate unwanted direct solar gain
- High levels of insulation
- Large amounts of internal thermal mass and night purging
- Air movement within classrooms should be enhanced with sweep fans
- Use of light shelves and borrowed light from adjacent spaces
- Rainwater harvesting and native planting
- Shade structures and trees should be provided wherever possible to protect students and buildings from high levels of UV in summer months

[14] Australian Government Department of the Environment and Heritage, Educating for a Sustainable Future, A National Environmental Education Statement for Australia, 2005, p. 3, http://www.environment.gov.au/education/publications/pubs/sustainable-future.pdf

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ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD)

5.1 Dandenong 7–12 High School, Dandenong, Victoria

Schools should be '… beautifully designed, colourful, inspirational, adaptable, sustainable, inclusive, fresh, safe, flexible, ICT enabled, multi-user, fun, delightful, curved, growing, natural…we need to try out new ideas, We need to look at ways of designing inspiring buildings that can adapt to educational and technological change…In the classroom of the future, the learning environment will look and feel different'.[15]

Secondary school students in the Dandenong and Doveton area will be a part of a unique opportunity to transform teaching and learning arrangements across the secondary school sector.

New facilities will be aligned with innovative curriculum and assist Dandenong High School to close the attainment gap that currently exists within the student population. Maximising the number of students completing secondary school education will also be a key focus through the inclusion of facilities that cater to current and future specialisms.

Dandenong High School will be a unique facility located centrally in the Dandenong/ Doveton community. The facilities that are designed for present and future needs will help deliver excellent learning programs. The mix of buildings, sporting facilities and grounds will support the school's curriculum program and assist teachers to facilitate the delivery of best pedagogical practice.

Effective student management, staff and pupil welfare, and the health, safety and well-being of the whole school community will also be strong considerations in the facility design.

[15] Classrooms of the Futures, Department for Education and Skills, United Kingdom, 2003, http://www.innovation-unit.co.uk/content/view/426/914/

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ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD)

Dandenong 7–12 High School

Theme 1
Context of the Project

Dandenong High School is located in the south-eastern suburbs, some 45 kilometres from central Melbourne.

The proposal for the new Dandenong High School was developed from work commenced in late 2004, which reviewed the access of students to pathways in the Dandenong, Cleeland and Doveton secondary schools.

The school that will result from the merging of the three secondary schools and will be a single Year 7–12 school located on the existing Dandenong High and Cleeland Secondary College sites. The school structure has been based on a Schools Within Schools (SWiS) model (interdependent school 'houses' or sub-school model).

The SWiS model combines all the advantages of large schools with their capacity to provide for all the curriculum program requirements of students and their need to access the broadest set of pathways into higher education, training and work. At the same time it provides appropriate and human-scale settings for students to build effective relationships with their teachers and their fellow students.

The school will occupy a site containing a mixture of some existing buildings from the original Dandenong High School site and a series of new buildings. The adjacent school site bisected by a suburban street will contain some new buildings and the school playing fields.

The design process has been undertaken with consultation from the school community comprising a Project Committee, a local Reference Group and extensive input from within the three schools in the form of focus groups representing learning areas.

Theme 2
Educational Philosophy

The vision for the Dandenong Education Precinct is to provide opportunity and access to excellence. Students will be exposed to the broadest possible range of learning options and career pathways within a culture of high expectations and the celebration of achievement. They will demonstrate high-level ICT skills and an appreciation of and participation in the full range of academic, cultural, and sporting activities offered by the school.

Educational programs for students will work to cultivate respect, understanding and tolerance of others. A key goal of the school will be to equip students for their lives beyond school in further study, training and employment. The school will endeavour to inculcate a love for learning and curiosity for inquiry.

Students will be clustered into multi-age Year 7–12 houses of about 250–300 students and will cater for student management, welfare and core curriculum classes. Small teams of teachers will provide home group/tutoring to small groups of students in each house. The establishment of a school culture with high expectations of its students and a strong work ethic will be enhanced by this model. This will be particularly important for the transition phase (Year 7) and the middle years stage (Years 8 and 9).

With the later years (Years 10–12) it is envisaged that a wide range of programs with possibilities for specialisation will be provided to students across the SWiS structure. A rich set of opportunities will be available to students through an extensive curriculum that offers access to a breadth of experiences in clubs, music, debating, drama and other extra-curricular activities.

Theme 3
Specific Proposed Pedagogical Outcomes

Curriculum Structure, Organisation and Delivery will be based on the SWiS model, which will create a multiple number of sub-school environments. The SWiS model enables teachers to have considerable authority over the instructional program within their particular house and it also enables them to facilitate cross-disciplinary learning through interdisciplinary lessons and projects.

There will be a consistent approach across all houses in applying the VELS. The cross-disciplinary teams will teach domains across all three strands through grouping domains into coherent and thematic semester subjects.

All students will be supported by their teachers to develop individual learning plans.

Curriculum in the transition years, Year 7 – establishing foundations and building relationships:

- a small number of teachers will be organised into cross-disciplinary professional learning teams
- students will have access to at least one significant teacher/mentor in their first year of secondary school.

Curriculum in Years 8 and 9 – building breadth and depth:

- student programs at these levels will be based around a core plus elective model
- individual learning plans and assessment of student learning will provide the basis for ongoing feedback and communication with students and parents.

Curriculum in the later years, Years 10, 11 and 12 – developing pathways:

- wide range of programs including VET, VCE and VCAL
- a diverse range of student learning backgrounds, skills, abilities and interests will be addressed
- on-site and off-site experiences will be provided for 'real world learning'
- VET studies outside the framework will be provided, directly by the school or through our association with Chisholm Institute of TAFE.

Theme 4
Key Planning and Design Features

The proposal is for a mix of facilities that will accommodate 7 houses or sub-schools, each one covering Years 7–12 and allowing for the learning needs of 250–300 students. In each house there may be 10–12 main learning areas with associated smaller learning areas of varying sizes clustered around a central resource area.

These houses will be fully detached. The modular flexible learning area design is essential to facilitate the changed pedagogical practice envisaged. In addition to these houses there will be central facilities containing assembly areas and general office/administration type spaces.

Site arrangements will take into account security and ensure an overall feeling of a structurally coherent and well-organised environment. The design focuses on effective staff supervision of students and will provide for possible additional buildings in the future as well as cater for aesthetic considerations.

The internal features of the new design allow for innovative approaches to learning and teaching. They incorporate the use of ICT across the curriculum, flexible learning spaces and furniture, emphasising visual and audio resources. The new school buildings have accessible power and network cabling and appropriate heating, lighting and ventilation, and will encourage widespread community use of the school's facilities.

The physical environment allows for the delivery of current and future curriculum models. The new school buildings have accessible power and network cabling and appropriate heating, lighting and ventilation.

The design features provide good social spaces to promote a healthy and effective lifestyle and good interpersonal relationships. Student services – toilets, lockers, shelter, cafeteria, open recreation spaces – are designed thoughtfully.

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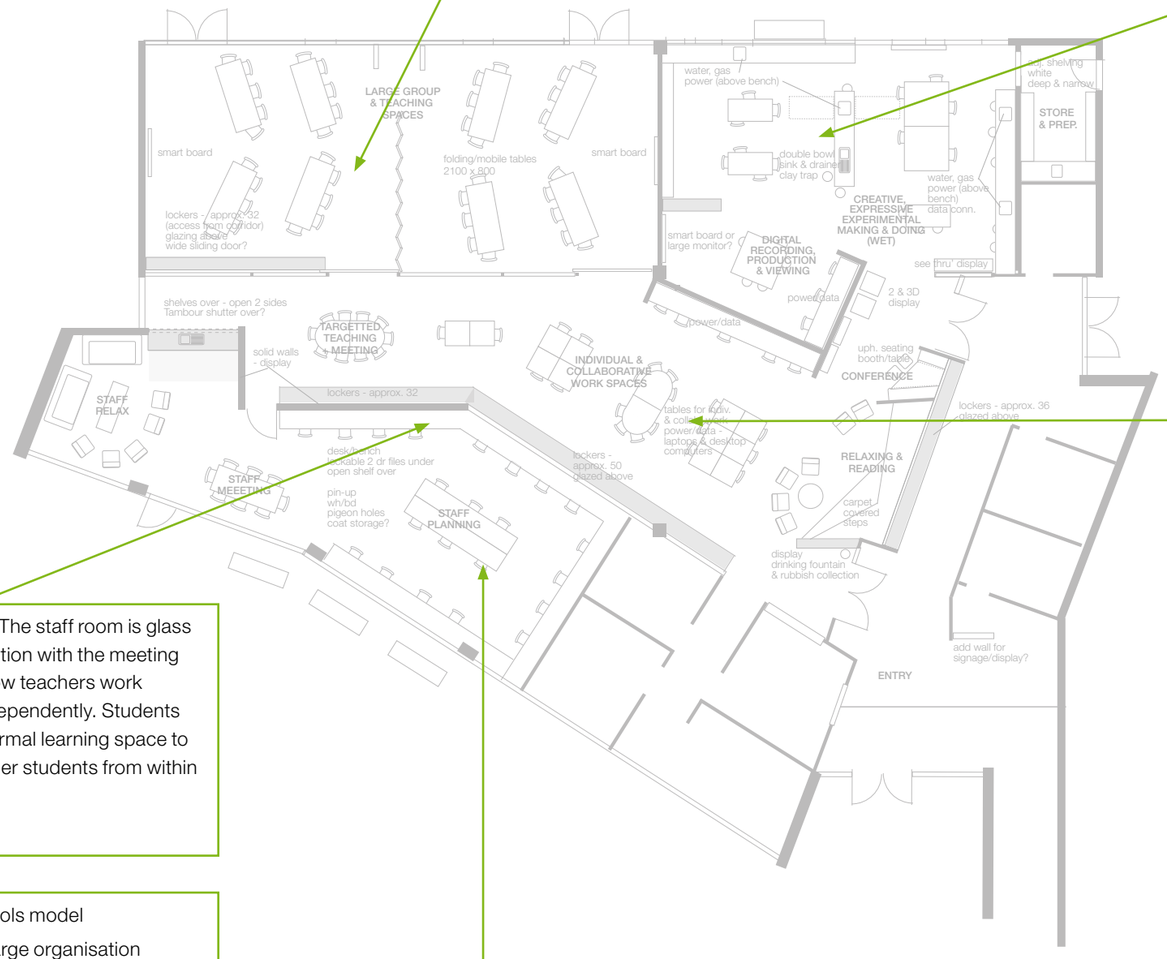
ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD)

Dandenong 7–12 High School

Figure 5.1: Site Master Plan, ground floor



Learning spaces for senior classes are designed to allow completion of SACS and assessment tasks.

A Science Lab/Wet area is built in each SWiS to ensure that student movement for practical science lessons in Years 7–9 is limited to within the SWiS.

Students will be encouraged to see that science has strong links to other areas of study through integrated projects.

The space will be used to conduct 'hands on' elements of integrated projects in Years 7–9.

The area is open to the outside for ease of conducting experiments (e.g. pulleys, measurement, etc.).

There is considerable traffic (student and staff) movement through the downstairs area and opportunities for positive student interaction can occur frequently, building positive cross-level relationships.

Formal house assemblies can also occur in this space (limited to 50 students).

Students enter the SWiS (house) and directly pass the SWiS office making tracking of student attendance easier and creating opportunities to meet with students frequently.

Downstairs staff common: The staff room is glass walled with a visual connection with the meeting common – students see how teachers work together as a team and independently. Students use the common as an informal learning space to meet with teachers and other students from within the SWIS.

SWiS: Schools within Schools model

- Small schools within a large organisation
- Teams of teachers
- Core subjects taught within the house
- Year 7–12 structure, creates a sense of belonging over a 6-year period
- Staff room populated by team
- Admin/leadership are responsible for attendance, notes, welfare relationships and nurturing
- Knowledge of individual students
- Student management and leadership
- Ownership – Years 7–9 upstairs
- 300 students – 50 students in each year level (Years 7 – 12)

Teachers also have the opportunity to build close working teaching relationships due to their location in one central space. Leadership is also located centrally to enhance working relationships with the AP's office, which is adjacent to the staffroom in each house.

Spaces can be categorised and described in three ways:

1. Quiet – for reflective, independent learning
2. Medium Noise – instructions, creation, presentation
3. Noisy – interactive, collaborative group work.

Consistency of approach

Teaching and learning practices of SWiS are supported within the internal design of each SWiS (also referred to as house). Each has a learning common, each has open learning spaces and ease of connection between learning spaces.

There is an emphasis on team teaching. Years 7, 8 and 9 will have a key group of 4–5 teachers with teaching, pastoral care and Individual Learning Plan responsibility.

Location: South Morang, Victoria

Year Levels: P–9

Architect: Oaten Stanistreet Architects

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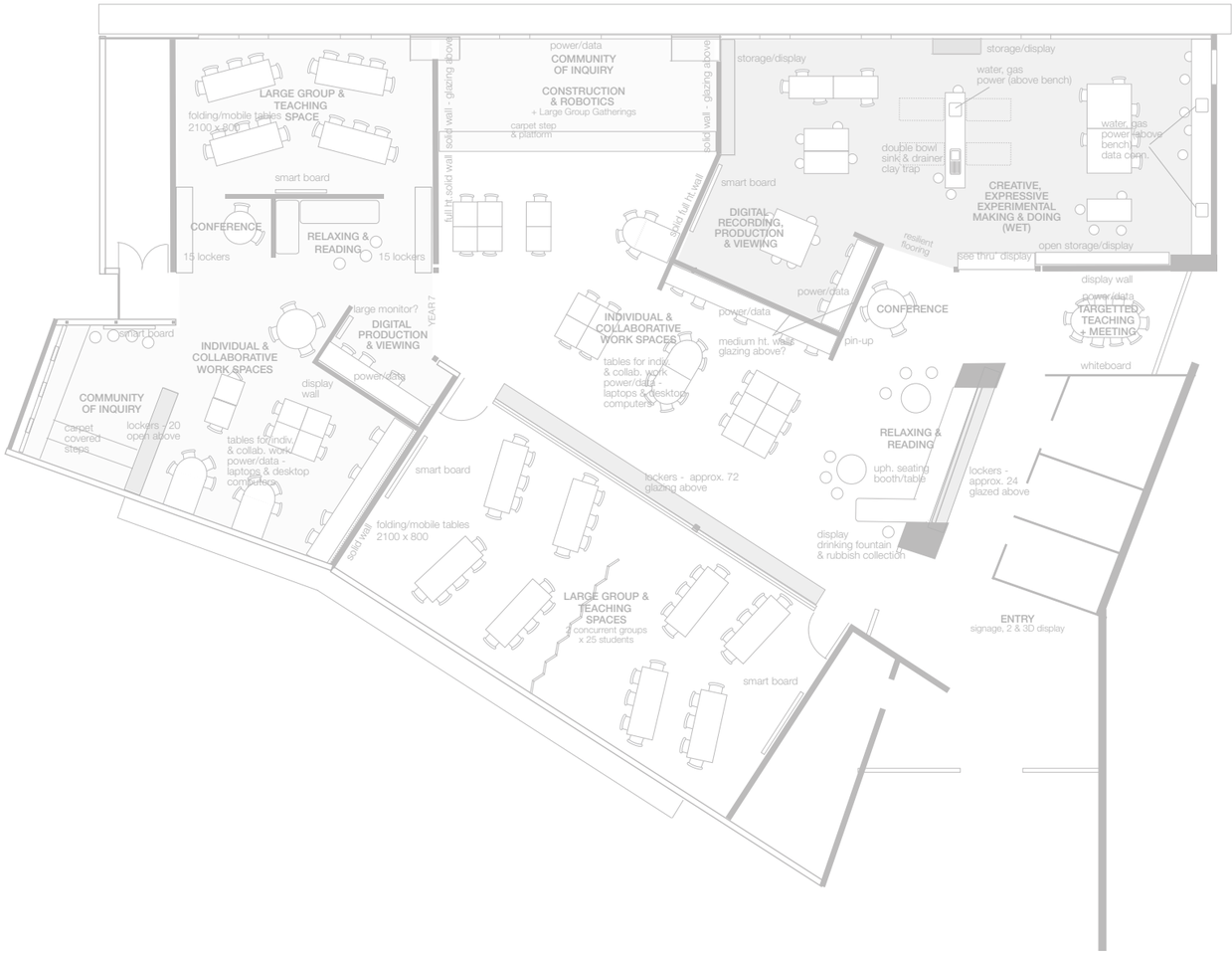
ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD)

Dandenong 7–12 High School

Figure 5.2: Site Master Plan, first floor



Teachers will work with students, operating as teams within this space.

The upstairs design was developed on the basis of the learning activities engaged in by students. Consequently, the layout of these spaces is currently emerging as the curriculum is developed. The furniture set out in this example has already changed considerably. Mary Featherston is currently designing furniture fit out for a trial Year 7 learning space to operate in semester 1 2008. This trial will inform the final design.

Years 7–9 students predominantly use this space. They will be in the SWiS for 65 per cent of their learning and upstairs for most of this time. The area will be divided into three main learning spaces.

The year 7 students have a clearly defined home base.

The year 8 and 9 students share a larger area.

Each year level = 50 students. At Year 7, three teachers will work as a team for most of the students' learning. At Years 8 and 9, two teachers and an aide will support student learning across the cohort of 50. Fourteen staff will be on the upstairs floor at any one time.

The teaching team for each group of 50 students will negotiate how best to use the space allocated to each of the year levels.

Location: South Morang, Victoria

Year Levels: P–9

Architect: Oaten Stanistreet Architects