

PROGRAMME OF THE WORKSHOP

NEW METHODS OF DAMAGE AND FAILURE ANALYSIS OF STRUCTURAL PARTS

November 1 – 4, 2016

Yokohama National University, Yokohama, Japan
Education and Culture Hall

Tuesday, November 1, 2016

09:00 – 09:30 **Registration**

09:30 – 10:20 **Opening Ceremony** **Room L**

CONFERENCE OPENING

Prof. OSAMU UMEZAWA, YNU, CONFERENCE CO-CHAIR

WELCOME REMARKS

Prof. HIROSHI FUKUTOMI, Ph.D. Dr.h.c., DEAN, FACULTY OF ENGINEERING,
YOKOHAMA NATIONAL UNIVERSITY

JAPANESE CZECH COOPERATION

Mr. TOMÁŠ DUB - AMBASSADOR, EMBASSY OF THE CZECH REPUBLIC IN
TOKYO

COOPERATION BETWEEN VŠB-TECHNICAL UNIVERSITY OF OSTRAVA AND
YOKOHAMA NATIONAL UNIVERSITY

Prof. JANA DOBROVSKA, DEAN FACULTY OF METALLURGY AND MATERIALS
ENGINEERING, VŠB-TUO

DEVELOPMENT OF WORKSHOP AND ITS FUTURE

Prof. Ing. BOHUMÍR STRNADEL, DrSc., VŠB-TUO, CONFERENCE CHAIR

INTRODUCTION OF HONORARY AND COMMITTEE MEMBERS

Prof. OSAMU UMEZAWA, YNU

SCHEDULE AND PROGRAM OVERVIEW

Prof. MAKOTO HASEGAWA, YNU, CONFERENCE SECRETARY

10:20 – 10:30 **Coffee Break**

10:30 – 11:30 **Plenary Lectures** **Room L**

Session Chairs: Dr. T. Ishikawa, Nippon Steel & Sumikin Technology Co. Ltd.,
Japan; Prof. W. Nakao, Yokohama National University, Japan

SUBSIZE SPECIMENS FOR FRACTURE RESISTANCE CHARACTERISATION
INCLUDING TRANSFERABILITY ISSUES
I. DLOUHÝ*, L. STRATIL, F. ŠIŠKA

DAMAGES OF MACHINES AND STRUCTURES IN GREAT EAST JAPAN
EARTHQUAKE DISASTER AND LESSONS LEARNED FROM THE DISASTER
M. SHIRATORI

11:30 – 13:00

Lunch

Cafeteria 1

13:00 – 15:05

Fracture I

Room L

Session Chairs: Prof. I. Dlouhý, Institute of Physics of Materials, Czech Republic; Prof. T. Shibusaki, Yokohama National University, Japan

FAILURE ANALYSIS OF BIG TURBINE BLADES
J. SIEGL*, I. NEDBAL, P. HAUŠILD

ANALYSIS ON CRITICAL CTOD OF LONG-TERM USED PENSTOCK
F. KAWAMURA, M. MIURA, R. EBARA, K. YANASE*

LBB APPROACH USABILITY STUDY FOR CORROSION DEFECT LEAKAGE
DETERMINATION
R. KRAUTSCHNEIDER*, L. JOCH, L. JURASEK, L. JUNEK

COMBINATION CRITERION FOR MULTIPLE LAMINAR FLAWS IN STEEL
COMPONENTS
V. LACROIX*, V. MARES, B. STRNADEL, K. HASEGAWA

EFFECT OF MICROSTRUCTURE AND TEXTURE ON THE BEHAVIOR OF CYCLIC
BENDING AND FRACTURE OF ALUMINIUM
H. IKEYA*, H. AKIYAMA, O. UMEZAWA, H. FUKUTOMI

13:00 – 15:05

Microstructure

Room M

Session Chairs: Dr. Y. Onuki, Ibaraki University, Japan; Prof. B. Strnadel, Technical University of Ostrava, Czech Republic

DEVELOPMENT OF EVALUATION METHOD THAT TAKES INTO ACCOUNT THE
EFFECT OF THE FINE STRUCTURE OF ADHESIVE INTERFACE FOR
DELAMINATION STRENGTH OF THE PACKAGING RESIN
Y. FURUYAMA*, O. HONDA, Q. YU

INFLUENCE OF SINTERING CONDITIONS ON MECHANICAL PROPERTIES OF AG-
NANO SINTERED MATERIAL
S. OKUNO*, Q. YU, Y. NAKATA

THE STABILITY OF RETAINED AUSTENITE AND TRANSFORMATION BEHAVIOUR
IN TRIP STEELS AT LOW TEMPERATURE
T. YAMASHITA*, N. KOGA, O. UMEZAWA

MICROSTRUCTURE CHARACTERIZATION OF A WELDED ROTOR
V. VODÁREK, A. VOLODARSKAJA

SOLID-STATE DIFFUSION BONDING OF TITANIUM BY USIG METAL SALT COATED
ALUMINUM SHEET
S. KOYAMA*, N.V. PHU

15:05 – 15:25 **Coffee Break**

15:25 – 17:05 **Fracture II** **Room L**

Session Chairs: Prof. J. Siegl, Czech Technical University in Prague, Czech
Republic; Prof. K. Takahashi, Yokohama National University, Japan

FRACTURE TOUGHNESS OF MASSIVELY TRANSFORMED AND SUBSEQUENTLY
HEAT TREATED TiAl INTERMETALLIC COMPOUND
K. SAKURAI*, M. HASEGAWA, I. DLOUHÝ

CRACK RESISTANCE CHARACTERISATION TiAl INTERMETALLICS SHOWING
ENHANCED TOUGHNESS
I. DLOUHÝ*, L. STRATIL, H. FUKUTOMI, M. HASEGAWA

ESTIMATION OF FRACTURE TOUGHNESS PROPERTY USING FLAT PUNCH
INDENTATION TEST
W. KIM*, J. KIM, S. JEON, S. CHOI, D. KWON

NUMERICAL SIMULATION OF FRACTURE TOUGHNESS TEST UNDER
MONOTONIC AND CYCLIC LOADING WITH LARGE PLASTIC DEFORMATION
H.S. NAM, Y.J. KIM*, J.W. KIM

15:25 – 17:05 **Degradation** **Room M**

Session Chairs: Dr. N. Koga, Yokohama National University, Japan; Prof. Q.
Yu, Yokohama National University, Japan

DEGRADATION MECHANISM OF DISSIMILAR METAL WELD JOINTS ON STEAM
GENERATOR COLLECTORS VVER 440MW TYPE
L. JUNEK, L. JURÁŠEK, Z. ČANČURA, M. ERNESTOVÁ, Z. SKOUMALOVÁ

INFLUENCE OF CHLORIDE ION ON SCC SUSCEPTIBILITY ON 15CR STAINLESS STEEL
AT HIGH TEMPERATURES UNDER CO₂ ENVIRONMENT
T. SUNABA*, S. HIRANO, T. ISHIHARA

POTENTIODYNAMIC POLARIZATION AND ELECTROCHEMICAL IMPEDANCE
SPECTROSCOPY USED FOR PREDICTION OF NITINOL STENT'S LIFETIME
J. HLINKA*, S. LASEK, J. BRANZOVSKY

RELATIONSHIP BETWEEN ELECTROCHEMICAL PARAMETERS AND
DEGRADATION PROCESS OF GLASS FLAKE COATINGS
D. ITO*, T. YOKOYAMA, S. OKAZAKI

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|----------------------|---------------------|--------------------|
| 17:05 – 17:20 | Announcement | Room L |
| 17:30 – | Dinner | Cafeteria 1 |

Wednesday, November 2, 2016

09:00 – 09:30 **Plenary Lecture** **Room L**
 Session Chairs: Prof. T. Łagoda, Opole University of Technology, Poland; Prof. K. Takahashi, Yokohama National University, Japan

EFFECT OF STRESS RATIO ON FATIGUE CRACK GROWTH THRESHOLD FOR STAINLESS STEELS IN AIR ENVIRONMENT
 K. HASEGAWA*, S. USAMI

09:30 – 09:50 **Coffee Break**

09:50 – 11:30 **Strength & Deformation** **Room L**
 Session Chairs: Dr. N. Koga, Yokohama National University, Japan; Prof. H. Sato, Hirosaki University, Japan

DYNAMIC BEHAVIOR OF HIGH STRENGTH ARMOR STEEL PLATES
 R. TOMÁŠEK, B. STRNADEL*, V. MAREŠ

PLASTIC DEFORMATION AND FRACTURE MECHANISMS OF AZ31 MAGNESIUM ALLOY DURING TENSILE DEFORMATION: FROM THE VIEWPOINT OF TEXTURE
 Y. ONUKI*, S. SATO, A. HOSHIKAWA, T. ISHIGAKI

ELASTIC MODULI, ISOTROPY, AND DEFORMATION ACCOMMODATION MECHANISMS OF COLD SPRAYED DEPOSITS
 H. SEINER, J. CIZEK*, P. SEDLAK, R. HUANG, J. CUPERA, I. DLOUHY, M. LANDA

MECHANICAL PROPERTIES OF FUNCTIONALLY GRADED POROUS ALUMINUM OF DISSIMILAR ALUMINUM ALLOY
 Y. HANGAI*, T. MORITA, T. UTSUNOMIYA

09:50 – 11:05 **Hardness Test** **Room M**
 Session Chairs: Prof. K. Kida, University of Toyama, Japan; Prof. Q. Yu, Yokohama National University, Japan

RELATION BETWEEN CHARPY IMPACT VALUE AND VICKERS HARDNESS OF REPEATEDLY QUENCHED HIGH CARBON HIGH CHROMIUM STEEL (SUJ2)
 K. MIZOBE*, I. YOSHIDA, K. KIDA

MECHANICS OF HERBERT PENDULUM HARDNESS TESTER AND ITS APPLICATION
 R. HALAMA*, J. PODEŠVA, R. SUZUKI, M. MATSUBARA

EFFECTS OF WEIGHT OF HERBERT PENDULUM ON HARDNESS EVALUATION

R. SUZUKI*, T. KABURAGI, T. SETAGAWA, M. MATSUBARA

11:30 – 12:30

Lunch

Cafeteria 1

12:30 – 14:35

Fatigue I

Room L

Session Chairs: Dr. T. Ishikawa, Nippon Steel & Sumikin Technology Co. Ltd., Japan; Prof. T. Łagoda, Opole University of Technology, Poland

USE OF THE FINITE STRAIN THEORY TO DETERMINE FATIGUE PROPERTIES

T. ŁAGODA, J. KOZIARSKA, A. KULESA, A. KUREK*

FATIGUE CRACK GROWTH SIMULATION USING S-VERSION FEM: APPLICATION TO INTERACTING SUBSURFACE CRACKS

A. TAKAHASHI*, A. SUZUKI, M. KIKUCHI

FATIGUE CRACK GROWTH BEHAVIOUR FOR ADJACENT TWO SURFACE FLAWS IN ACCORDANCE WITH COMBINATION RULES

K. LU*, Y. LI, K. HASEGAWA, V. LACROIX

CRACK CLOSURE AT FATIGUE CRACK GROWTH UNDER NEGATIVE R RATIO

Y. YAMAGUCI*, Y. LI, V. MARES, K. HASEGAWA

CRACK GROWTH RATE OF R7T STEEL UNDER UNIAXIAL LOADING

V. MARES*, B. STRNADEL, L. HORSÁK

12:30 – 14:35

Reliability

Room M

Session Chair: Prof. H. Sato, Hirosaki University, Japan; Prof. J. Siegl, Czech Technical University in Prague, Czech Republic

EVALUATION OF ECONOMICAL RISK USING BAYESIAN THEOREM FOR STRUCTURAL HEALTH MONITORING

A. IWASAKI*, K. KAWAKATA

RELIABILITY EVALUATION OF CAR POWER MODULE USING ELECTRICAL-THERMAL-STRUCTURAL COUPLED ANALYSIS BASED ON FIELD DRIVING DATA

S. NAKAYAMA*, H. MORITA, Q. YU

EFFECT OF PRE-CRASH PHASE ON OCCUPANT PROTECTION WITH SEATBELT

Y. ZAMA*

NON-DESTRUCTIVE STRESS EVALUATION OF A TOOL STEEL USING A SCANNING HALL PROBE MICROSCOPE: EFFECT OF STRESS DIRECTION ON THREE DIMENSIONAL MAGNETIC FIELDS

K. KIDA*, A. YADOIWA, T. YAMADA, R. KAWAMURA, M. ISHIDA

EFFECT VERIFICATION OF WELD-PERIPHERY HEATING ON WELDING
SOLIDIFICATION CRACK PREVENTION FOR LASER WELDING OF THIN STEEL
PLATE

S. KIKUCHI*, T. OSUKI, M. FUKUMOTO, K. OGAWA

14:35 – 14:55 **Coffee Break**

14:55 – 17:00 **Fatigue II** **Room L**

Session Chairs: Prof. I. Dlouhý, Institute of Physics of Materials, Czech
Republic; Prof. T. Shibusaki, Yokohama National University, Japan

A NEW MODEL FOR ESTIMATION FATIGUE LIFE UNDER CYCLIC LOADING FOR
SELECTED MATERIALS

M. KUREK, T. ŁAGODA*

FATIGUE LIMIT IMPROVEMENT BY PEENING FOR WELDED JOINT CONTAINING A
CRACK-LIKE DEFECT – EVALUATION FOR THE DEFECT SIZE RENDERED
HARMLESS –

R. FUEKI*, K. TAKAHASHI

MICRO-CRACK GENERATION IN CYCLICALLY DEFORMED TI-FE-O ALLOY AT
LOW TEMPERATURE

W. LI*, O. UMEZAWA

EFFECTS OF SLIP RATIO ON DAMAGE AND MICROCRACKS IN CARBURIZED
SCM420 STEEL UNDER ROLLING CONTACT FATIGUE

J. SANEKATA*, N. KOGA, O. UMEZAWA

STRAIN DISTRIBUTION ANALYSIS ON CYCLICALLY DEFORMED HIGH
STRENGTH STEEL USING DIGITAL IMAGE CORRELATION

N. KOGA*, Y. SAKAMAKI, O. UMEZAWA, H. NAKATA, S. TOYODA

14:55 – 16:10 **Creep** **Room M**

Session Chair: Prof. B. Strnadel, Technical University of Ostrava, Czech
Republic; Dr. Y. Onuki, Ibaraki University, Japan

LOW-STRESS CREEP IN NEW SANICRO 25 STEEL AND ITS RELATION TO LONG-
TERM CREEP LIFE

L. KLOC*, P. DYMÁČEK, L. STRATIL*, N. LUPTÁKOVÁ

EXTRAPOLATION OF IMAGINAL MINIMUM CREEP RATE IN COMPRESSION BY A
CONCEPT OF SATO-INDEX

H. SATO

CREEP FRACTURE BEHAVIOR OF FIBER-REINFORCED SELF-HEALING CERAMIC

W. NAKAO*, J.W. LEE

17:00 – 17:10 **Announcement** **Room L**

17:30

Dinner

Cafeteria 1

Thursday, November 3, 2016

09:00 – 11:05 New Testing Methods Room L

Session Chairs: Prof. W. Nakao, Yokohama National University, Japan; Prof. K. Kida, University of Toyama, Japan

APPLICATION OF SMALL PUNCH TEST FOR EVALUATION OF MECHANICAL PROPERTIES OF NEWLY DEVELOPED ODS STEELS

D. BÁRTKOVÁ, P. DYMÁČEK, H. HADRABA, R. HUSÁK

DUCTILE FAILURE SIMULATION OF SMALL PUNCH TEST USING STRESS-MODIFIED FRACTURE STRAIN ENERGY MODEL

J.M. LEE, H.S. NAM, J.Y. JEON, Y.J. KIM*, J.W. KIM

ESTIMATION OF FRACTURE TOUGHNESS FROM SMALL PUNCH TEST USING STRESS-MODIFIED FRACTURE STRAIN ENERGY MODEL

J.M. LEE, H.S. NAM, J.Y. JEON, Y.J. KIM*, J.W. KIM

PRESENTATION TITLE 1

K. MATOCHA

PRESENTATION TITLE 2

K. MATOCHA

11:05 – 11:25 Coffee break

11:25 – 11:45 Closing of Lectures Room L

Prof. B. STRNADEL, CONFERENCE CHAIR

11:45 – 12:00 Announcement Room L

Prof. M. HASEGAWA, CONFERENCE SECRETARY

12:00 – 13:00 Lunch (Lunch Box) Room L

Free Time

18:30 – 20:30 Conference Gala Dinner (Umayo no Shokutaku)

Friday, November 4, 2016

08:00 Meeting & Departure to Kita-kamakura

08:50 Meeting at Kita-kamakura

Tour of Kamakura
Lunch
Round table discussion
17:00 **Breaking up on the spot**

Notice: The length of lecture is 25 minutes including time for discussion.

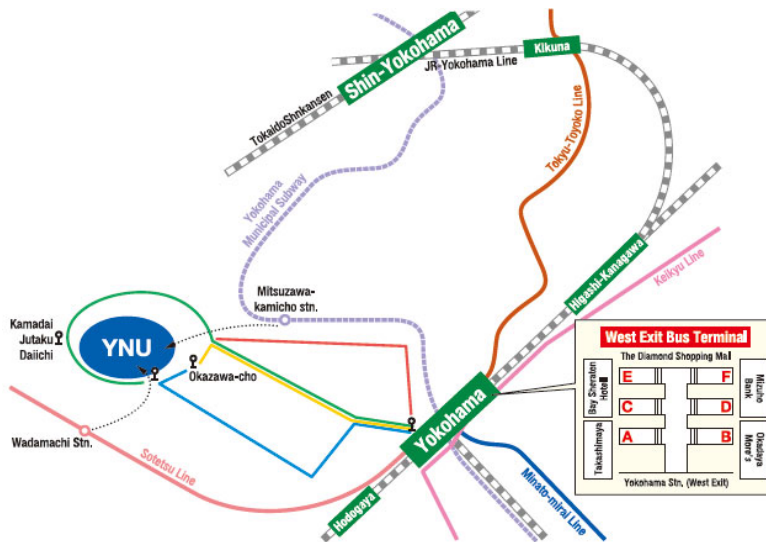
ACCESS to YNU

Transportation to Yokohama

- The following are some of the most convenient routes available to reach Yokohama Station:
 - From Tokyo Station to Yokohama Station — 30 minutes by JR Tokaido Line or Yokosuka Line
 - From Tokyo Narita Airport to Yokohama Station — 90 minutes by JR Narita Express
 - From Tokyo Narita Airport to Yokohama City Air Terminal (YCAT) — 120 minutes by Airport Limousine Bus
 - From Tokyo Haneda Airport to Yokohama Station — 20 minutes by Keihinkyuko Line
 - From Tokyo Haneda Airport to Yokohama City Air Terminal (YCAT*) — 30 minutes by Keikyu Bus

*YCAT is located in the Yokohama Sky Building by the East Exit of Yokohama Station.

Transportation from Yokohama Station to Yokohama Natl. Univ.



- By Taxi (From the west exit of Yokohama Station)
 - It takes about 15 minutes from the west exit of Yokohama Station to Yokohama Natl. Univ.
- By Train
 - Use Yokohama Municipal Subway from Yokohama Station and get off at Mitsuzawa-kamicho Station. It takes about 16 minutes on foot to reach the main gate of YNU.
- By Bus
 - Use a bus at the bus terminal located at the west exit of Yokohama Station. It takes about 20 minutes from the west exit of Yokohama Station to YNU.

Details of the access are available on the YNU web site
(<http://www.ynu.ac.jp/english/access/index.html>)

YNU CAMPUS MAP



CAMPUS MAP

ADMINISTRATION BUREAUS

- N1** Delivered Goods Acceptance and Inspection Center
- N2** Administration Bureau East Annex, Admissions Division (1F)
- Administration Bureau
- Administration Bureau West Annex
- Office Garage
- S1** Security Officers' Station
- S5** Student Center
1F: Center for Health Service Science, Nail Part
2F: Student Support Division, Educational Affairs Division, Student Advisory Service
3F: Career Support Room

COLLEGE OF EDUCATION AND HUMAN SCIENCES/ GRADUATE SCHOOL OF EDUCATION (Ed+H)

- S2** Lecture Hall 8 (Ed+H)
- Lecture Hall 7 (Ed+H)
- Education Design Center
- S3** Lecture Hall 6 (Ed+H)
- Research Bldg 1 (Ed+H)
- Administration (Ed+H)
- Research Bldg 2 (Ed+H)
- Annex to Faculty of Education Bldg. (Research)
- S4** Music
- Fine Arts
- Research Bldg 3 (Ed+H)

COLLEGE OF ECONOMICS (Econ)

- N4** Research Bldg. (Econ)
- Lecture Hall 1 (Econ)
- Lecture Hall 2 (Econ)
- New Research Bldg. (Econ)

COLLEGE OF BUSINESS ADMINISTRATION (Bus. Admin)

- N3** Business Administration Research Bldg.
- Lecture Hall 2 (Bus. Admin)
- Research Bldg. (Bus. Admin)
- Lecture Hall 1 (Bus. Admin)

GRADUATE SCHOOL OF INTERNATIONAL SOCIAL SCIENCES/ FACULTY OF INTERNATIONAL SOCIAL SCIENCES

- N3** International Graduate School of Social Sciences
- N4** Law Bldg.

COLLEGE OF ENGINEERING SCIENCE/ GRADUATE SCHOOL OF ENGINEERING/ FACULTY OF ENGINEERING (Eng)

- N6** Computer Lab., Division of Electrical and Computer Engineering
- Dept. of Electrical and Computer Engineering
- Voltage Room
- Dept. of Mechanical Engineering and Materials Science 2
- Dept. of Mechanical Engineering and Materials Science
- Metal Forming Lab.
- N7** High Voltage Research Lab.
- Solar-Hydrogen Energy Research Lab.
- Machine Shop A
- Machine Shop B
- Flow Visualization Lab.
- N8** Low Temperature Engineering Research Lab.
- Dept. of Energy Engineering
- Administration (Eng)
- Chemical Engineering and Safety Engineering
- Hazardous Materials Inhouse Storage
- N10** Dept. of Naval Architecture and Ocean Engineering A
- Ship Model and Seakeeping Basin
- Dept. of Naval Architecture and Ocean Engineering B
- S5** Science Research Bldg.
- Lecture Hall A (Eng)
- Engineering Science Lab.
- Lecture Hall A (107) (Eng)
- Lecture Hall B (Eng)
- Lecture Hall C (Eng)



- S7** Science and Engineering Lab. for Graduate School
- Bioengineering and Computer Engineering Lab.
- Dept. of Chemistry
- S9** General Research Bldg. W
- GRADUATE SCHOOL OF ENVIRONMENT AND INFORMATION SCIENCES/ FACULTY OF ENVIRONMENT AND INFORMATION SCIENCES**
- S6** Environment and Information Sciences 4
- Environment and Information Sciences 3
- S7** Environment and Information Sciences 1
- S9** General Research Bldg. S, E
- GRADUATE SCHOOL OF URBAN INNOVATION/ FACULTY OF URBAN INNOVATION**
- N5** Structure Lab., Div. of Architecture and Building Science
- Materials and Environment Testing Lab., Dept. of Architecture and Building Science
- Dept. of Architecture and Building Science
- S8** Structure Lab., Dept. of Civil Engineering
- Dept. of Civil Engineering
- Hydraulic Lab., Dept. of Civil Engineering
- COMMON FACILITIES FOR RESEARCH AND EDUCATION**
- N11** Support Center for Gender Equality

- N4** Global-Local Education and Research Center
- Center for Economic Growth and Strategy
- N7** Cross-Faculty Research Bldg. B
- Cross-Faculty Research Bldg. A
- N8** Instrumental Analysis Center
- N9** Research Initiatives and Promotion Organization, Cooperative Research and Development Center
- S1** Education and Culture Hall
- S5** International Student Center
- Annex Bldg. of Information Technology Service Center, Admission and Education Center
- Center for Risk Management and Safety Sciences
- Information Technology Service Center
- S6** Cross-Faculty Research Bldg. D
- Cross-Faculty Research Bldg. C
- S7** Center for Oceanic Studies and Integrated Education
- Institute of Advanced Sciences
- S8** Facility for R&D Research and Education
- S9** Center for Future Medical Social Infrastructure Based on Information Communications Technology
- Incubation Facility

- LIBRARIES**
- S3** Central Library
- S7** Science and Technology Library
- MONITORING CENTERS**
- N7** Energy Center: General Machine Plant
- N9** Wastewater Treatment Facility
- WELFARE FACILITIES**
- N10** S-Garden (Cafeteria, Convenience Store)
- Cafeteria 2, COOP
- Cafeteria 1 (Rengakan)
- University Hall, COOP (HQ)
- STUDENT SPORTS AND RECREATION FACILITIES**
- S0** Student Club House Sports Club
- Control Office and Sports Facilities
- Student Activities Facilities
- Gymnasium
- Archery Target Range